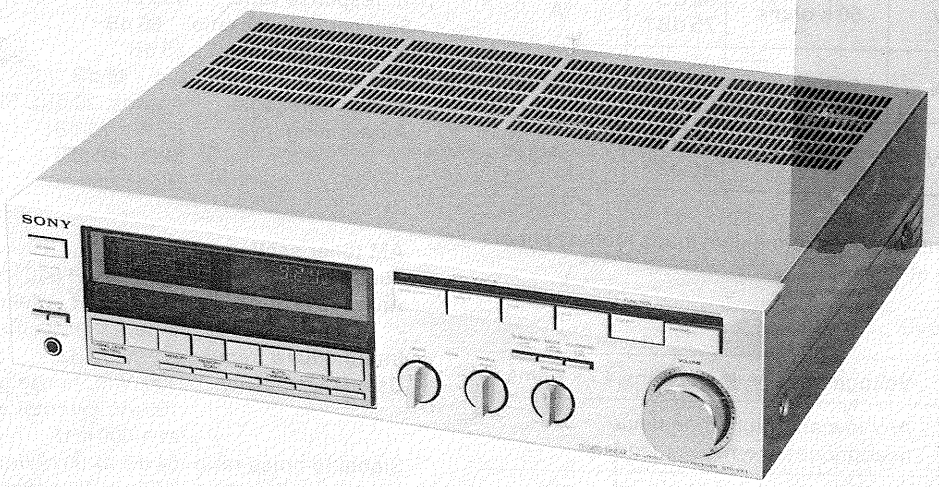
7045

STR-

US M.
Canadian Mod.
E Model



FM STEREO/FM-AM RECEIVER

SPECIFICATIONS

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

AUDIO POWER SPECIFICATIONS

Power output and total harmonic distortion
With 8 Ω loads, both channels driven, from 20–20,000 Hz; rated 40 W per channel minimum RMS power, with no more than 0.008 % total harmonic distortion from 250 mW to rated output.

OTHER SPECIFICATIONS

Amplifier section

Damping factor	50 at 1 kHz, 8 ohms
Dynamic headroom	1.4 dB*
Intermodulation (IM) distortion (60 Hz : 7 kHz = 4 : 1)	Less than 0.008% at rated output
Residual noise	Less than 120 μV at 8 ohms, network A

— Continued on page 2 —

MICROFILM

SONY®
SERVICE MANUA

	Sensitivity	Impedance	S/N	Weighting network
PHONO	2.5 mV	50 k ohms	82 dB 75 dB*	A
TAPE 1, 2	150 mV	50 k ohms	105 dB 80 dB*	A
AUX	150 mV	50 k ohms	105 dB 80 dB*	A

* '78 IHF

Measured with rated output power into 8-ohm loads (both channels driven simultaneously) at 1 kHz

Outputs (with rated input)

REC OUT 1, 2	Voltage 150 mV, Impedance 4.7 k ohms
HEADPHONES	Any low and high impedance headphones are recommended.
SPEAKER A, B	Any speakers of 8 - 16 ohms are recommended.

Frequency response PHONO : RIAA equalization curve ±0.5 dB
AUX, TAPE 1, 2 : 5 Hz - 90 kHz $^{+0}_{-1}$ dB
Tone controls BASS : ±8 dB at 100 Hz
TREBLE : ±8 dB at 10 kHz
Loudness control (att. 30 dB)
+8 dB at 50 Hz, +2 dB at 10 kHz
Subsonic filter 12 dB/octave attenuation below 15 Hz

FM tuner section

Tuning range 87.5 - 108 MHz
Antenna terminals 300 ohms, balanced
75 ohms, unbalanced
Intermediate frequency 10.7 MHz
Sensitivity at 50 dB quieting
17.3 dBf, 4 μV (mono)
36.8 dBf, 38 μV (stereo)
Usable sensitivity 11.2 dBf, IHF 2 μV
Signal-to-noise ratio 83 dB (mono), 78 dB (stereo)
Harmonic distortion 0.08% (mono), 0.2% (stereo) at 100 Hz
0.08% (mono), 0.15% (stereo) at 1 kHz
0.1% (mono), 0.2% (stereo) at 6 kHz
Separation 40 dB at 100 Hz
45 dB at 1 kHz
40 dB at 6 kHz
Frequency response 30 Hz - 15 kHz $^{+0.5}_{-1.5}$ dB
Alternate channel selectivity 80 dB (400 kHz)
Capture ratio 1.0 dB
AM suppression ratio 54 dB
Image response ratio 85 dB
IF response ratio 100 dB
Spurious response ratio 95 dB
RF intermodulation 65 dB
Sub-carrier product ratio 45 dB
Muting threshold Approx. 20 dBf, 5.5 μV
Auto tuning level LOW : 20 dBf
MID : 40 dBf
HIGH : 60 dBf

AM tuner section

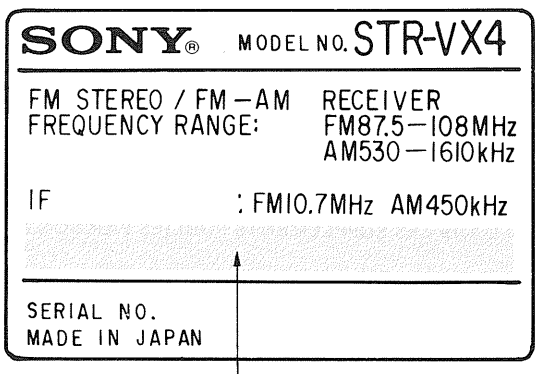
Tuning range 530 kHz - 1,610 kHz (522 kHz - 1,602 kHz)
Antenna Ferrite-bar antenna
External antenna terminal
Intermediate frequency 450 kHz
Usable sensitivity 300μV/m, ferrite-bar antenna
100 μV, external antenna
at 1,000 kHz
Signal-to-noise ratio 54 dB at 50 mV/m
Harmonic distortion 0.5% at 50 mV/m, 400 Hz
Selectivity 40 dB at 10 kHz

General

System Tuner section : PLL quartz-locked digital synthesizer system
Equalizer amp section : IC op-amp, NF type
Tone amp section : NF type
Power amp section : Pure-complementary DC amp
Power requirements US, Canadian model : 120 V ac, 60 Hz
E model : 110, 120, 220, 240 V ac 50/60 Hz

Power consumption USA model : 110 W
Canadian model : 180 W
AC outlets 1 switched 80 W, 1 unswitched 300 W
Dimensions Approx. 430×105×375 mm (w/h/d)
(17 × 4 1/4 × 14 7/8 inches)
including projecting parts and controls
Weight Approx. 7.6 kg (16 lb 13 oz) net
Approx. 8.6 kg (19 lb) in shipping carton

MODEL IDENTIFICATION



US model: AC 120V 60Hz 110W
Canadian model: AC 120V 60Hz 180W
E model: AC: 110, 120, 220, 240 V ~ 50/60Hz 180W

Handling Precautions for MOS ICs

Generally, the insulation resistance of the oxide layer in MOS IC structures is very high, and the oxide layer is very thin. Because of this, it is possible that the static voltages usually present on clothes and the human body will be enough to generate a potential difference across the insulator, high enough to cause a breakdown of the insulating layer.

The following precautions should be taken while handling these ICs.

(Particular care should be taken under conditions of low humidity.)

Precautions in Replacing MOS ICs

1. Store new ICs by inserting them into a urethane-polyester cushion (which is somewhat conductive), or wrapping it in aluminum foil, so that all the pins are at the same potential.
   (The ICs should be stored in that manner until mounted on the circuit board.)

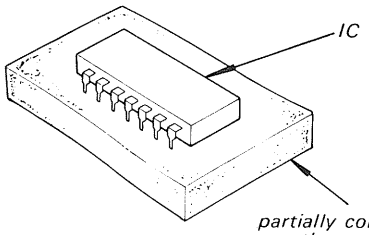


Fig. A

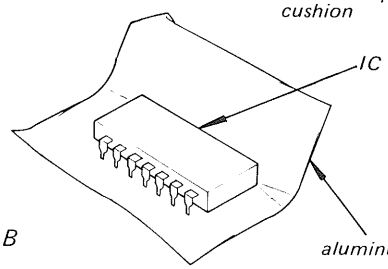


Fig. B

2. Check the soldering iron for possible power-line leakage current. Make sure that there is no leakage path by connecting an ohmmeter to the tip of the soldering iron and the plug as shown in Fig. C. If there is a leakage path, use some other soldering iron.

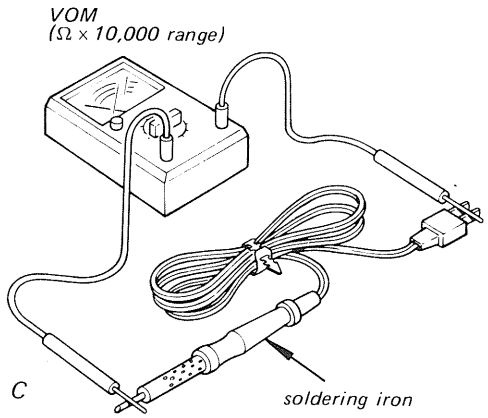


Fig. C

3. Equalize any potential difference between the clothes, the tools in use, the work bench, the set being worked on, and the packaged IC by touching them all in succession with the hands or a conductive wire or tool.

4. The following are effective methods for handling ICs that remove the potential difference across the oxide layer.
   - Use a paper clip modified by soldering in a wire braid insert.

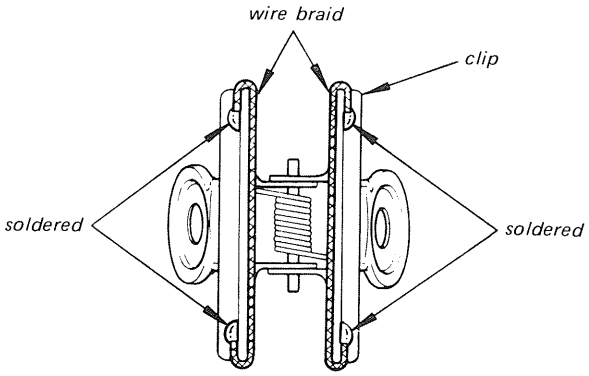


Fig. D

Make sure that there is no solder on the inside.

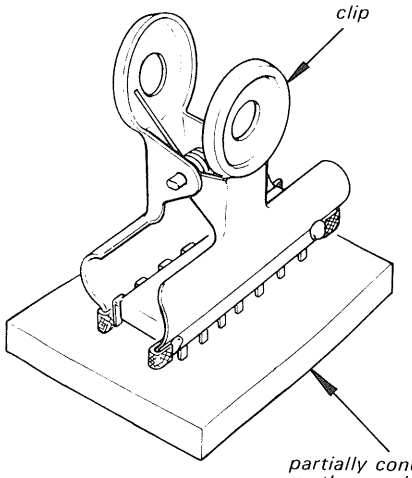
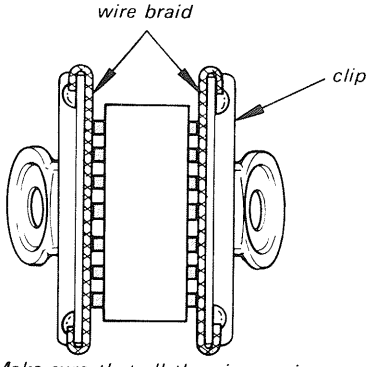


Fig. E



Make sure that all the pins are in contact with the wire braid (all the pins will then be at the same potential.).

Fig. F

- Take a short length of fine bare wire and wind it around the IC so that it shorts all the pins of the IC, while it is still in the urethane-polyester cushion or aluminum foil. This ensures that all the pins are at the same potential.

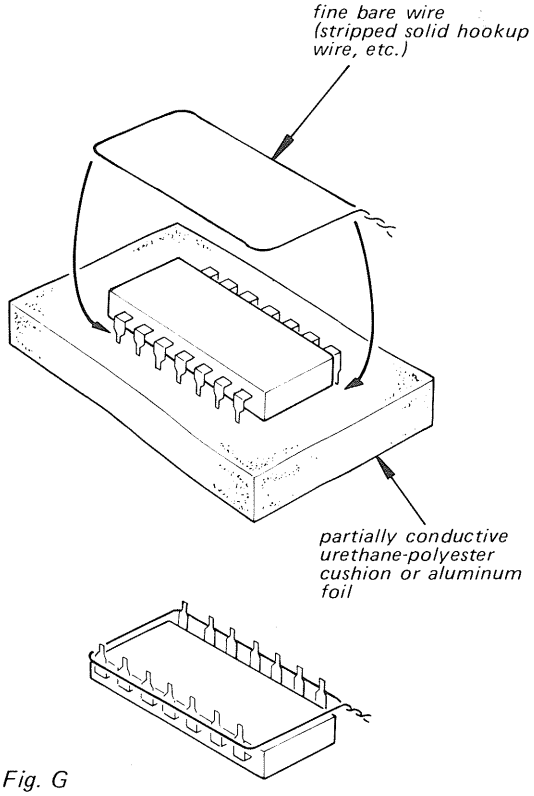


Fig. G

- When it is necessary to handle the IC with the fingers, do not touch any pin, and hold the IC at the ends of its plastic-package case as shown in Fig. H.

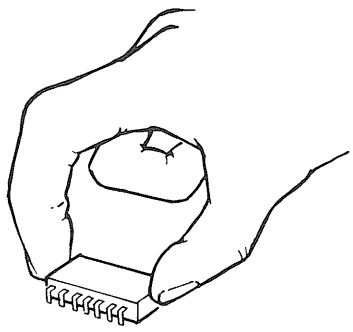


Fig. H

5. Method of Mounting
Insert the IC while holding it with the modified clip, and solder all the pins with the clip still shorting the pins. (Similarly, solder all the pins while the bare shorting wire is still wound around them.). Remove the clip or the bare shorting wire only after all the pins have been soldered.

Precaution while Checking C-MOS ICs

The C-MOS ICs (Complementary MOS) are MOS ICs that have their output sections made up of N-channel and P-channel push-pull stages to increase their speed of operation. If the output terminal of these ICs comes into contact with B+ or B– voltage, then the FET which is ON at that time will either become shorted or open.

This is valid for all the output sections that are connected together by the interconnections. Even the circuits that are physically separated (and not on the same board) can be destroyed simultaneously.

Example:

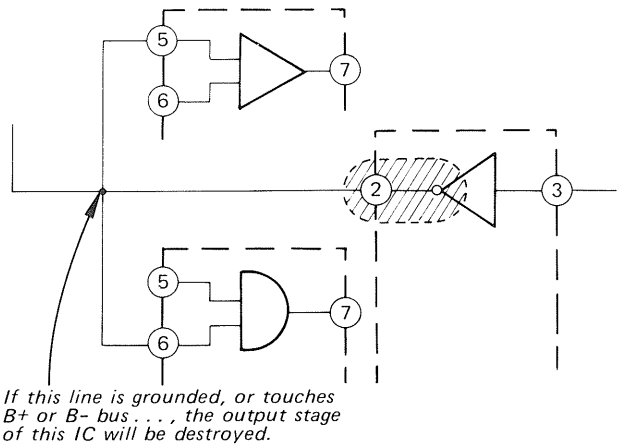
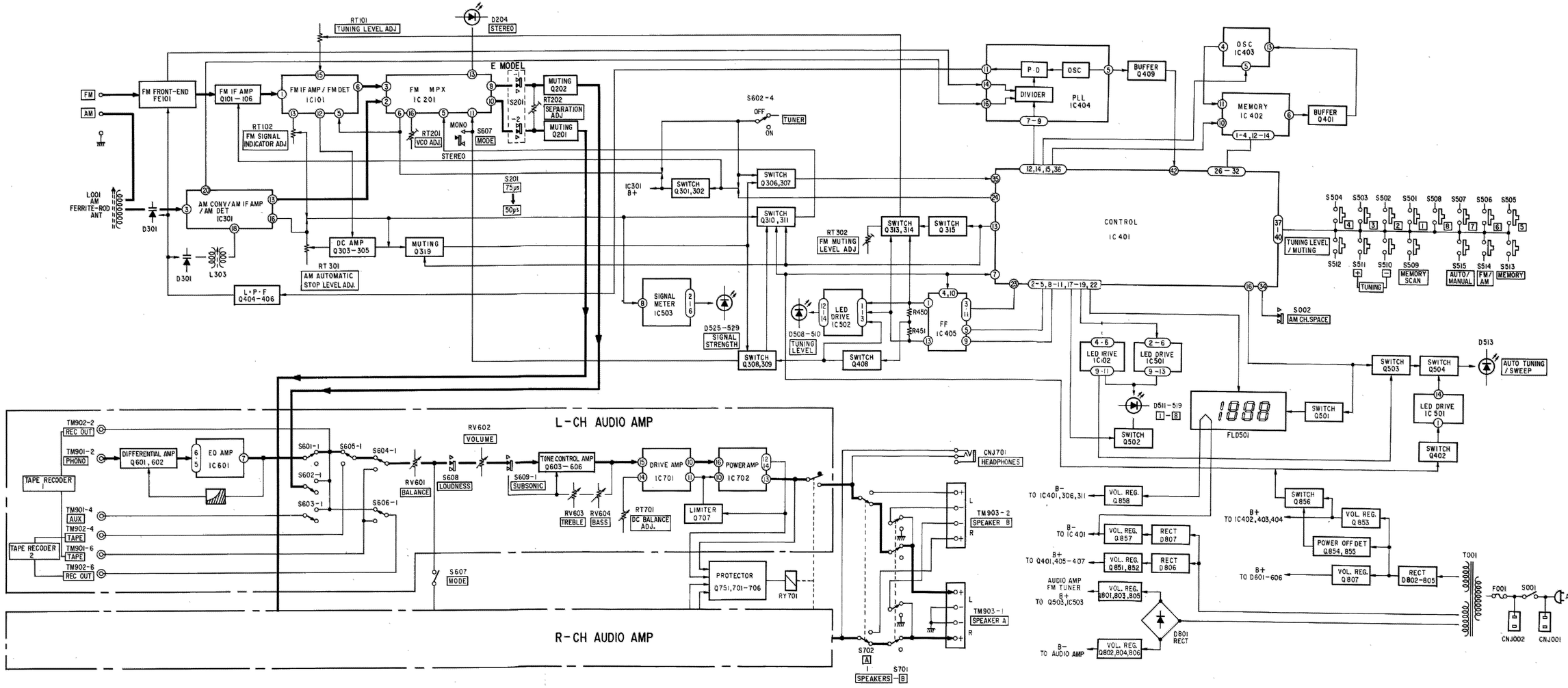


Fig. I

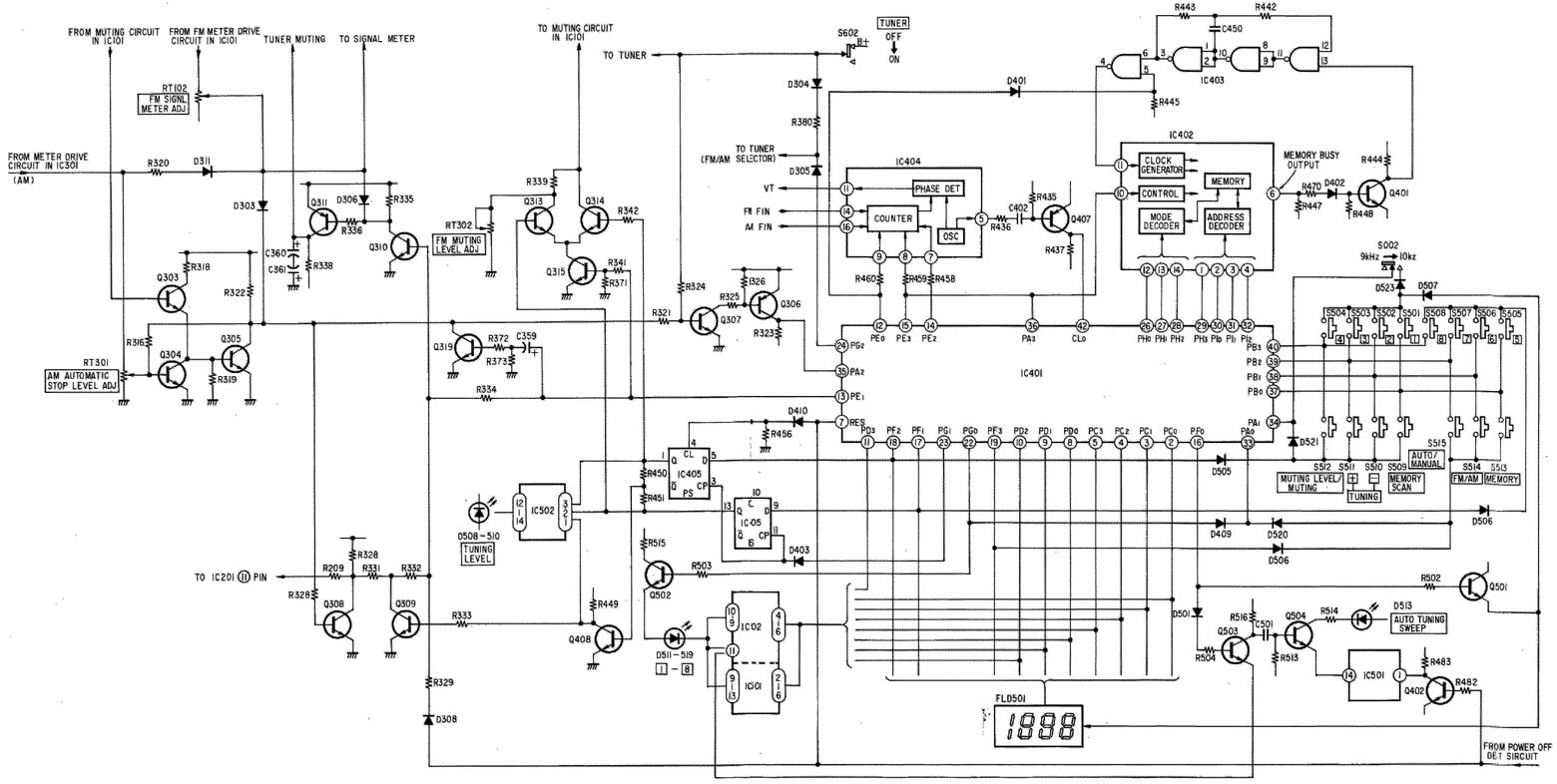
SECTION 1
OUTLINE

1-1. BLOCK DIAGRAM

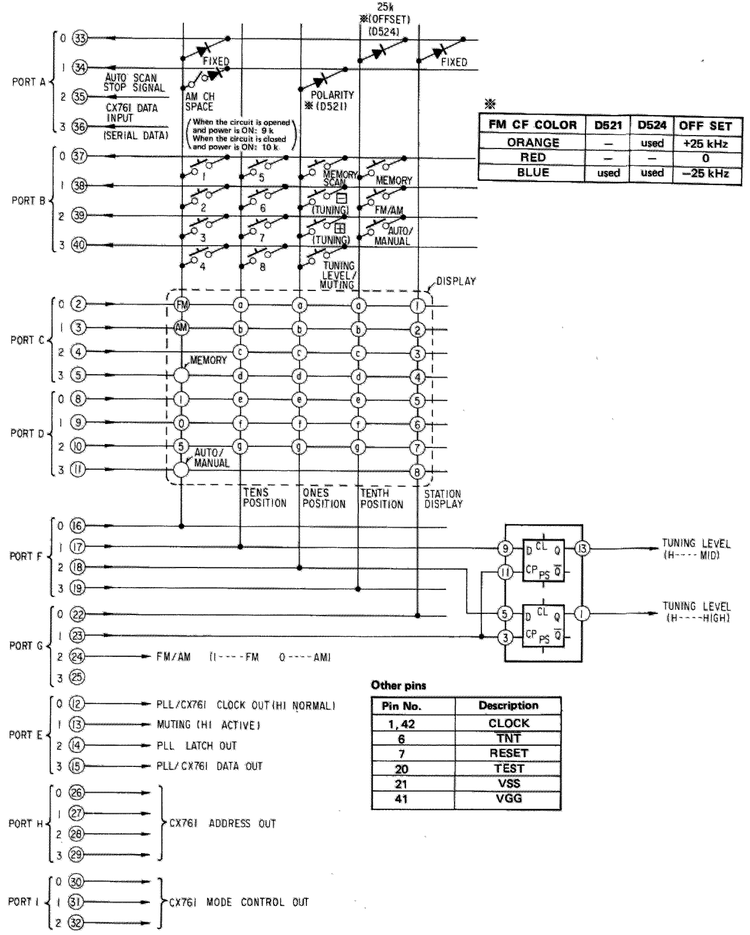


1-2. CIRCUIT DESCRIPTION

(1) Circuit Diagram Around μPD553C



(2) μPD553C Port Map



※

FM CF COLOR	D521	D524	OFF SET
ORANGE	–	used	+25 kHz
RED	–	–	0
BLUE	used	used	–25 kHz

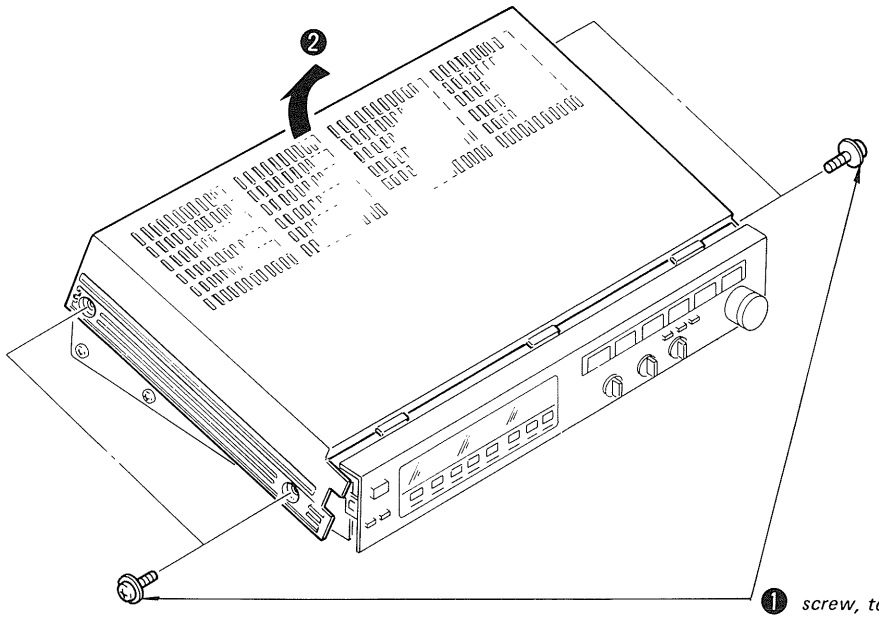
Other pins

Pin No.	Description
1, 42	CLOCK
6	TNT
7	RESET
20	TEST
21	VSS
41	VGG

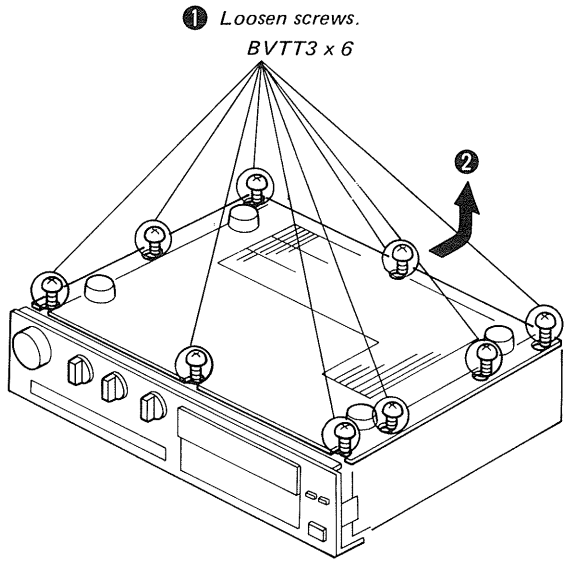
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

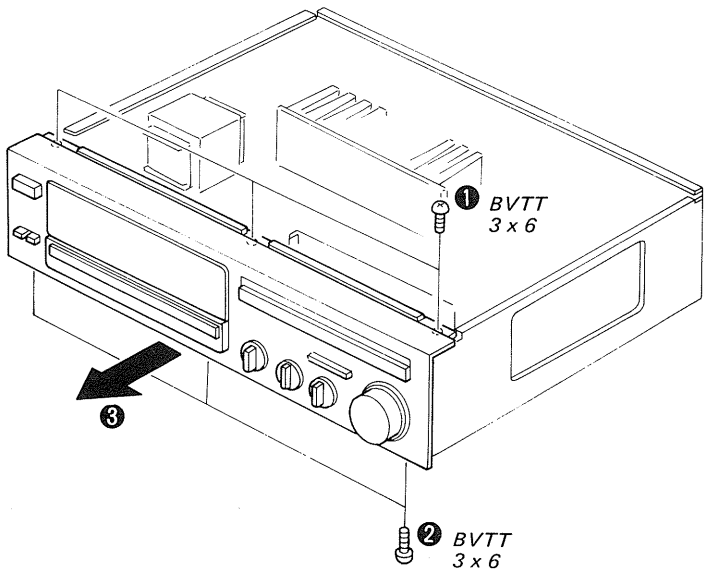
Top Cover



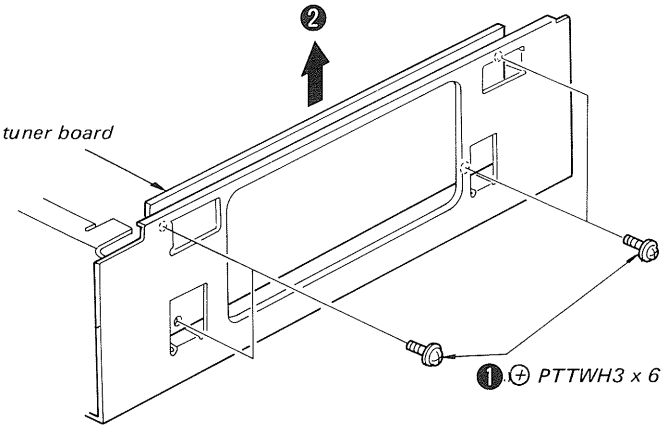
Bottom Plate



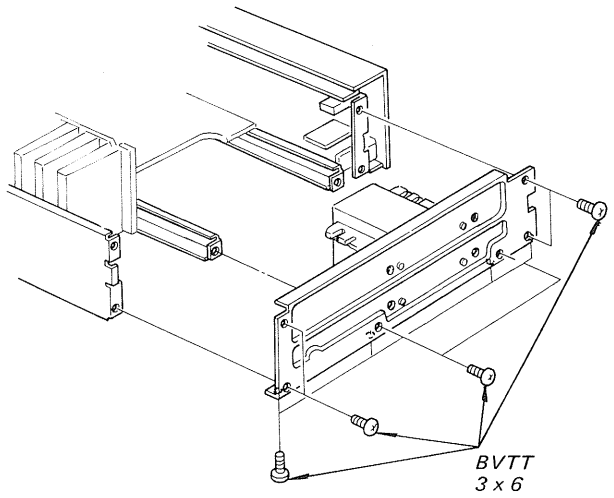
Front Panel



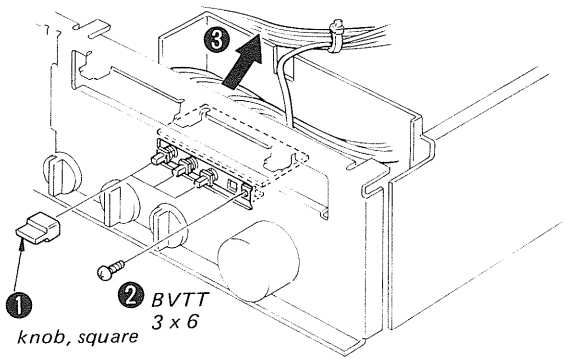
Tuner Board



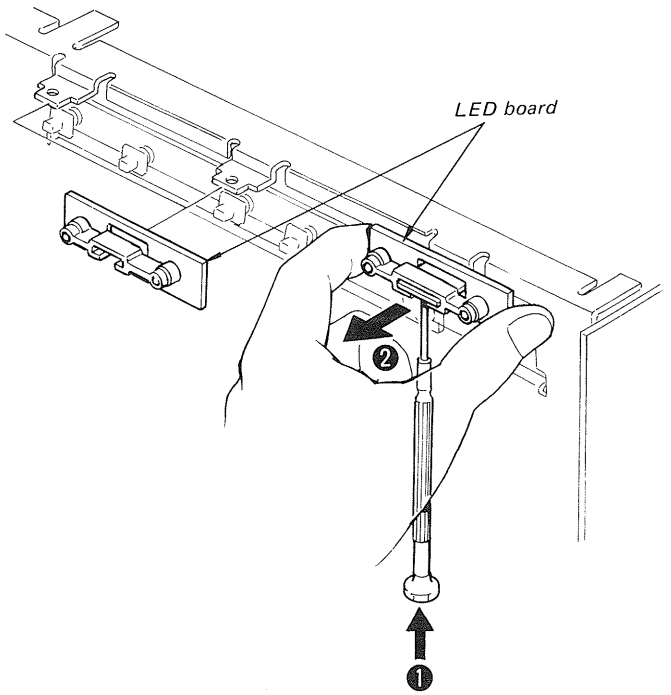
Side Plate (R)



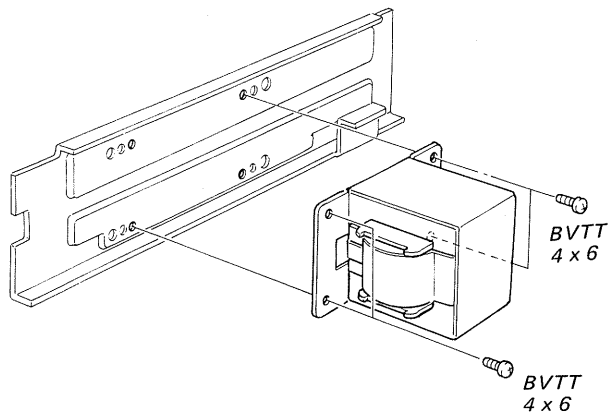
SUB SW Board



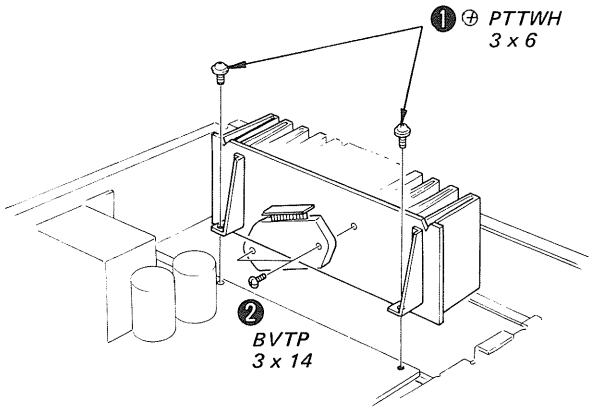
LED Board



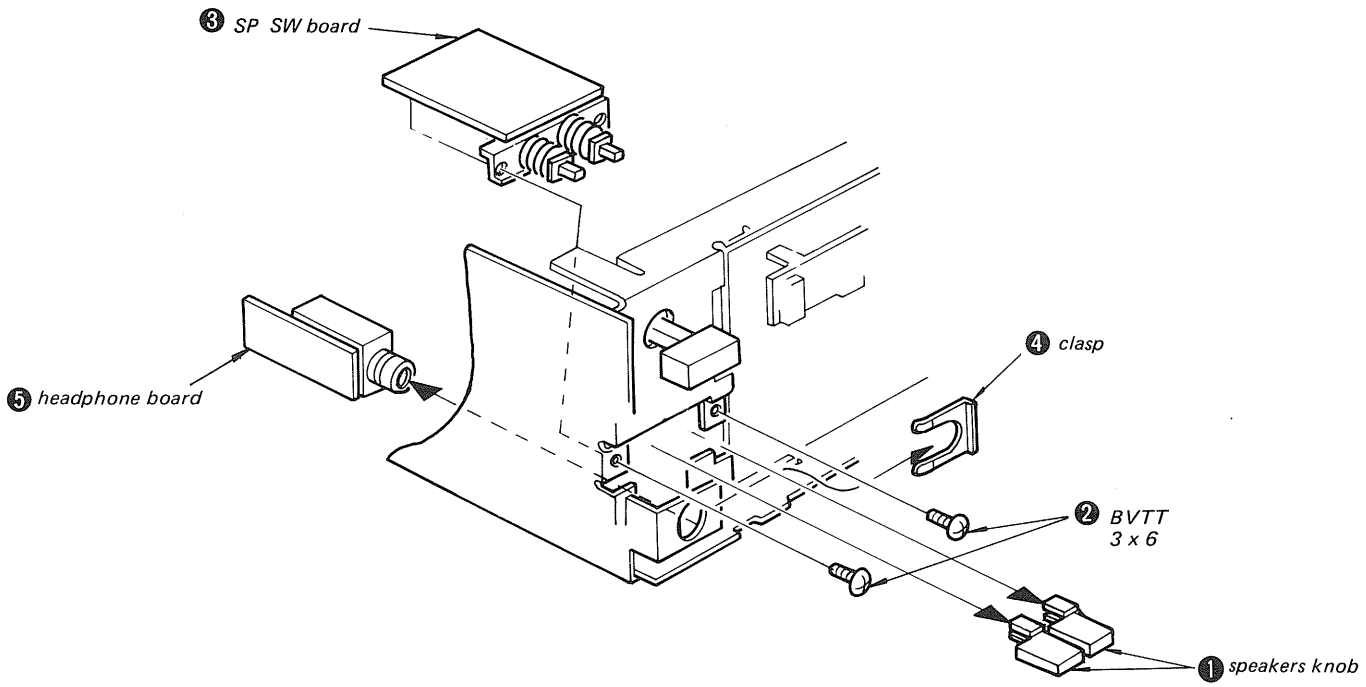
Power Transformer



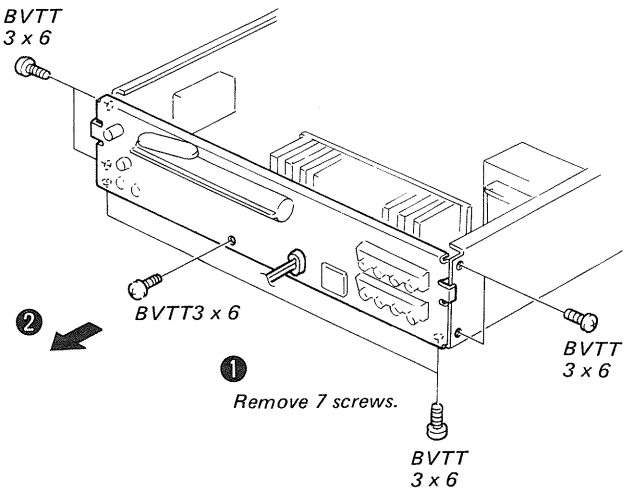
Heat Sink



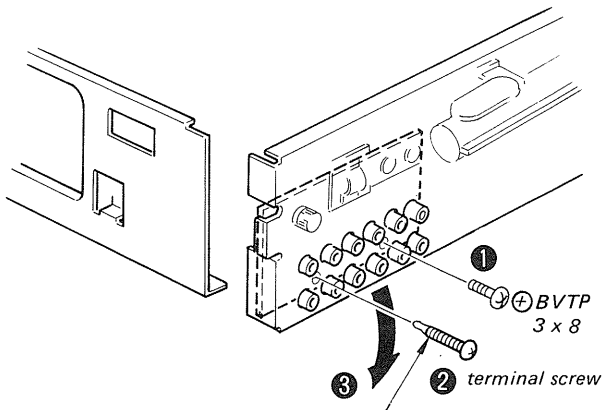
SP SW Board, Headphone Board



Jack Plate

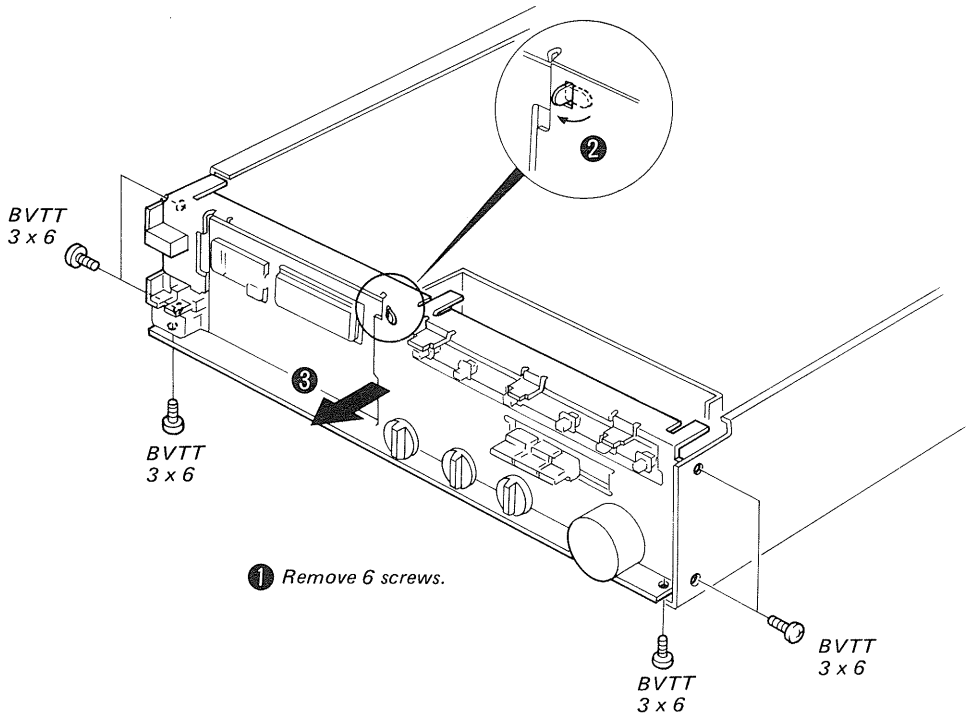


Pin Jack Board

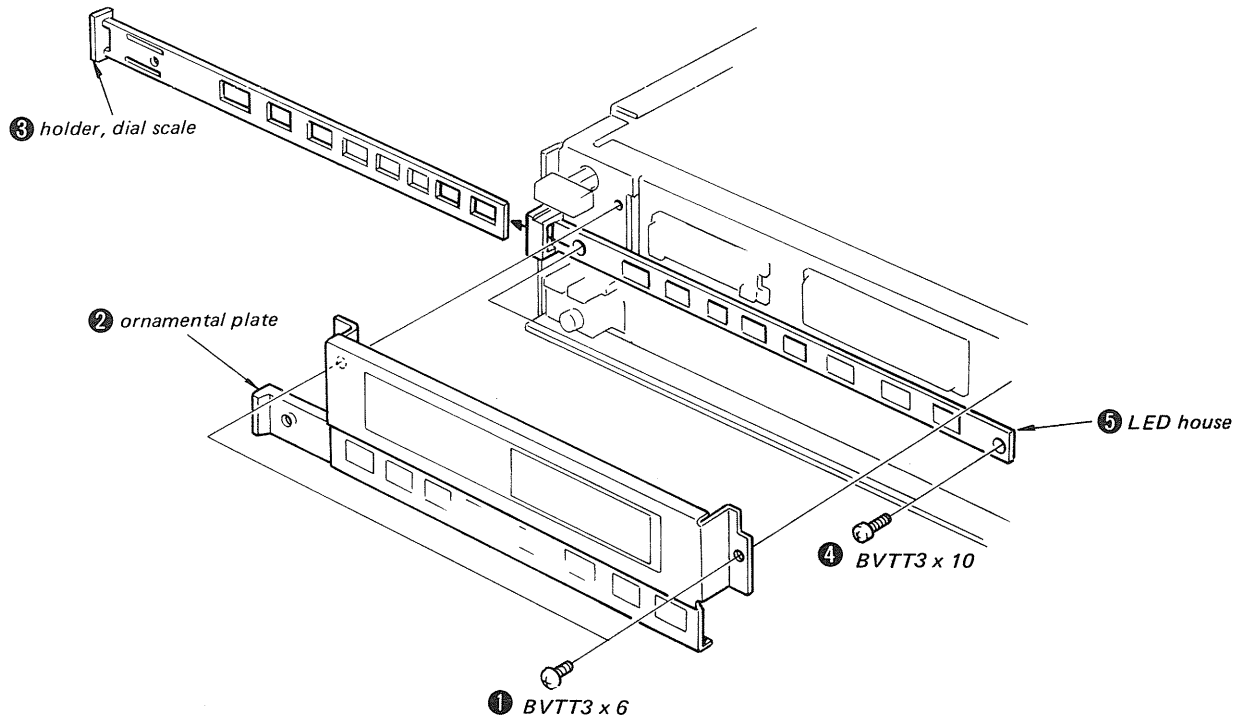


This portion is soldered on the patterns of the board, but this screw can be removed by turning it hard with a screwdriver. Solder here again when assembling.

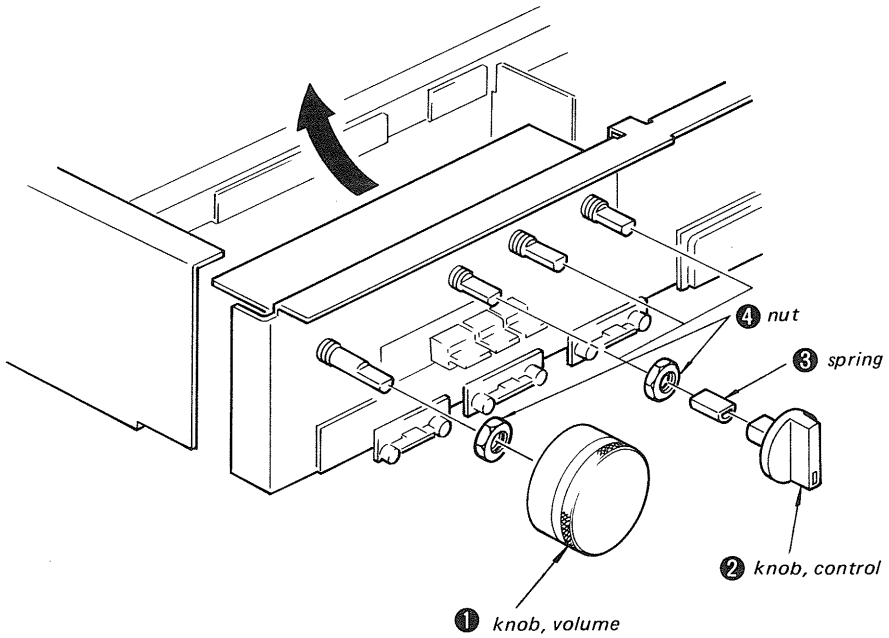
SUB Panel

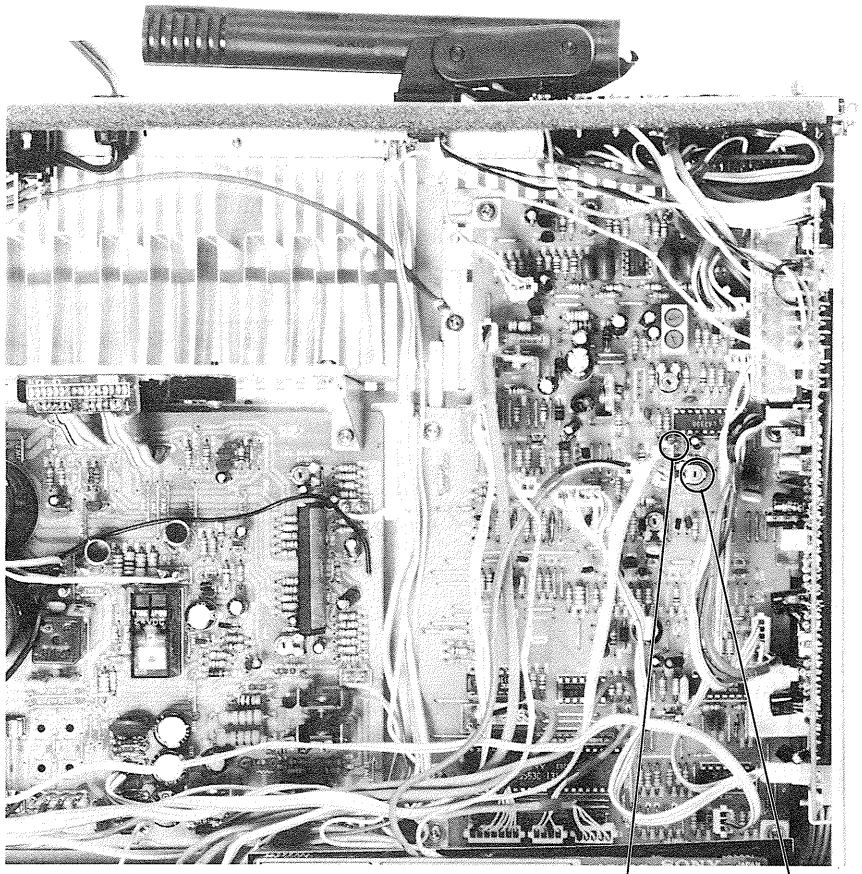


Ornamental Plate, LED House



Tone Control Board

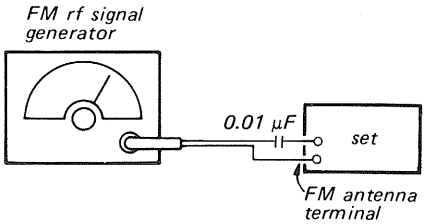




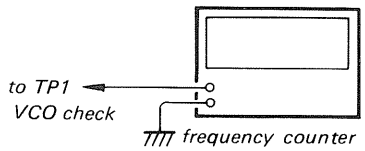
VCO Adjustment

A) Regular Method

Procedure:



Carrier frequency: 98 MHz
Modulation: no modulation
Output level: 1 mV (60 dB)

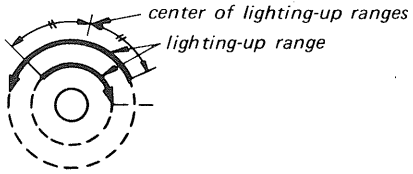


1. Tune the set to 98 MHz.
2. Adjust RT201 for 19 kHz ±25 Hz on the counter.

B) Simple Method

Procedure:

1. Tune the set to the FM stereo broadcasting signal.
2. Turn RT201 clockwise or counterclockwise and memorize the lighting-up range of stereo lamp.
3. Secure RT201 at the center of the lighting-up range of both turns as shown below.

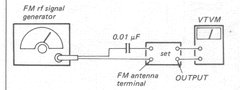


FM Muting Level Adjustment

Setting:

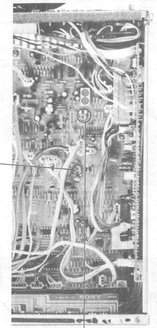
MUTING switch: ON

Procedure:



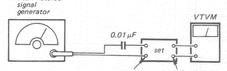
Carrier frequency: 98 MHz
Modulation: 400 Hz, 75 kHz deviation (100 %)
Output level: 5.6 µV (20 dB)

1. Tune the set to 98 MHz by pressing the MANUAL TUNING switches.
2. Adjust RT302 so that VTVM reading suddenly changes.



FM Stereo Separation Adjustment

Procedure:



Carrier frequency: 98 MHz
Output level: 1 mV (60 dB)
Mode: Stereo
Modulation:
Audio (400 Hz), sub-channel: 33.75 kHz deviation (45 %)
Pilot (19 kHz): 7.5 kHz deviation (10 %)

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RT202 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RT202 for minimum reading.

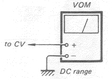
L-CH Stereo separation: Ⓐ – Ⓑ
R-CH Stereo separation: Ⓒ – Ⓓ

The separations of both channels should be equal.

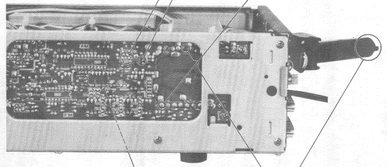
AM SECTION

- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

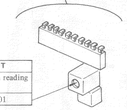
VC ADJUSTMENT		DIAL INDICATION
Adjust for specified reading on VOM.		
L303	1.5 V	530 kHz
CT302	22 V	1610 kHz



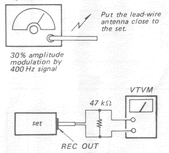
Adjustment should be done from the component side.

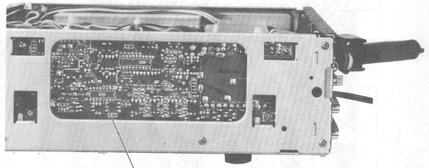


IF ALIGNMENT	
Adjust for a maximum reading on VOM.	
450 kHz	IFT301

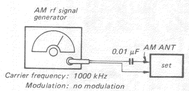


TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L001	600 kHz
CT301	1400 kHz





Automatic Stop Level Adjustment



Setting:

RT301: mechanical mid

Procedure:

1. Tune the unit to the 1,000 kHz signal.
2. Adjust output level of signal generator so that the second segment of SIGNAL LED lights up.
3. After the second segment of SIGNAL LED goes off, adjust RT301 so that it lights up again.

MEMO

Semiconductor Lead Layouts

2SA1027R

2SK246

S4VB40

2SB731
2SD809

IS1555
10E2
HZ6A2L
HZ30-3L
HZ7A1L

CX-761A
CX-776A
LA1235
LA1245
LA3390
TL489CP
µPA67C
µPD4011C
µPC4557C
µPD4013C
µPD553C131

2SB647-B

GL-3NG95
GL-3PR5

2SB834
2SC1986

GL-5NY55-A

2SC2458

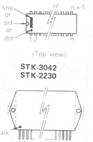
GL-9PR20
GL-9NG2

2SC710-14

KV-1226

2SA1015
2SC1362
2SC1364
2SC1400
2SD667-A

STK-3042
STK-2230



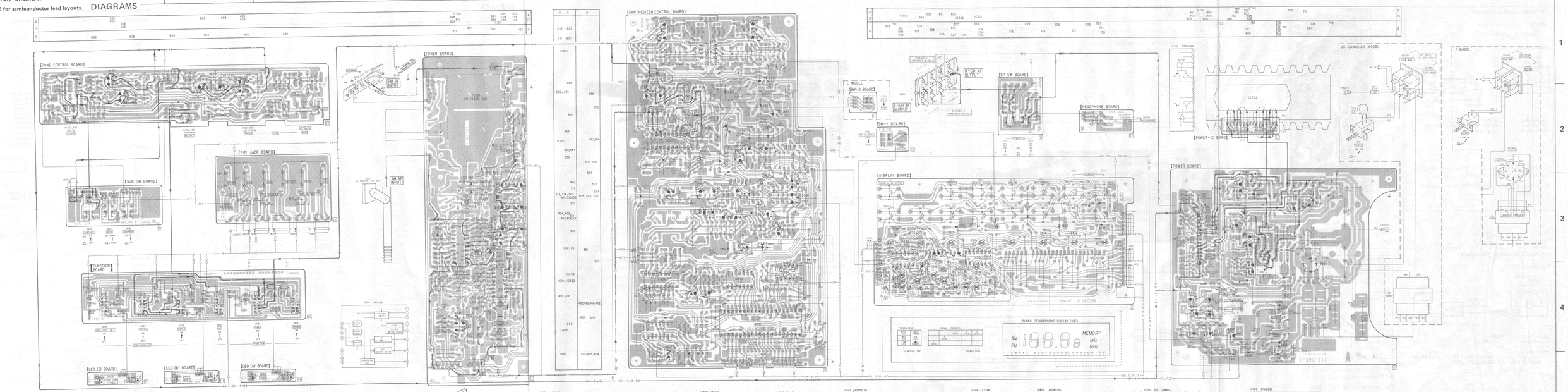
STR-VX4 STR-VX4

STR-VX4 STR-VX4

SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM

• See page 25 for semiconductor lead layouts.

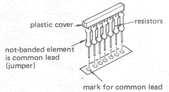


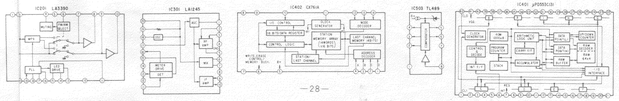
Note:

- Color code of sleeving over the end of the jacket.

- ■ : part mounted on the conductor side.
- ⊣⊢ : indicates side identified with part number.
- : B + pattern
- : B – pattern
- : signal path
- : L-CH signal path
- : R-CH signal path

- When one of resistors of combination component CP401 and CP402 is defective;
  a) Strip the plastic covering over the top-side common conductor.
  b) Remove the defective resistor from the common conductor and circuit board.
  c) Install an ordinary single resistor in place of the removed resistor.
  d) Cover the common conductor with adhesive.

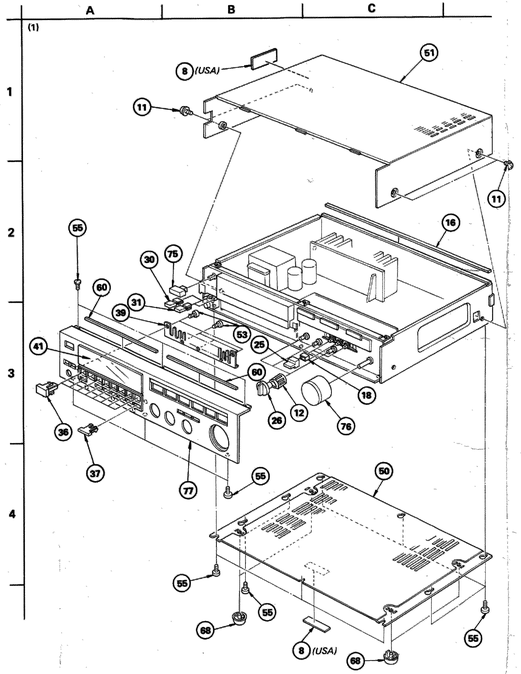




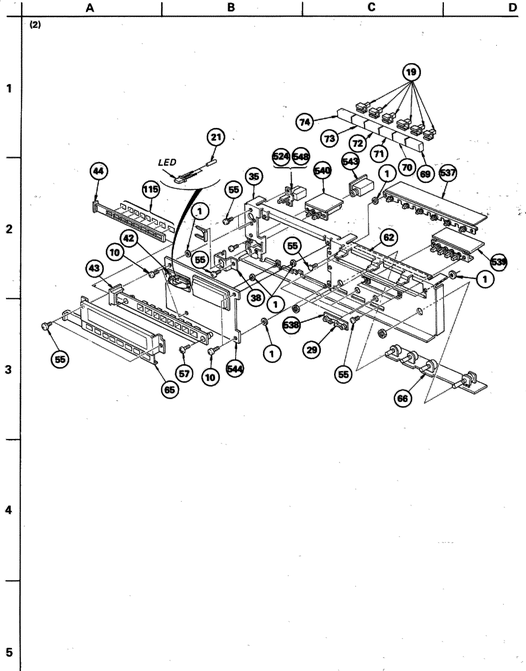
SECTION 5

EXPLODED VIEWS AND PARTS LIST

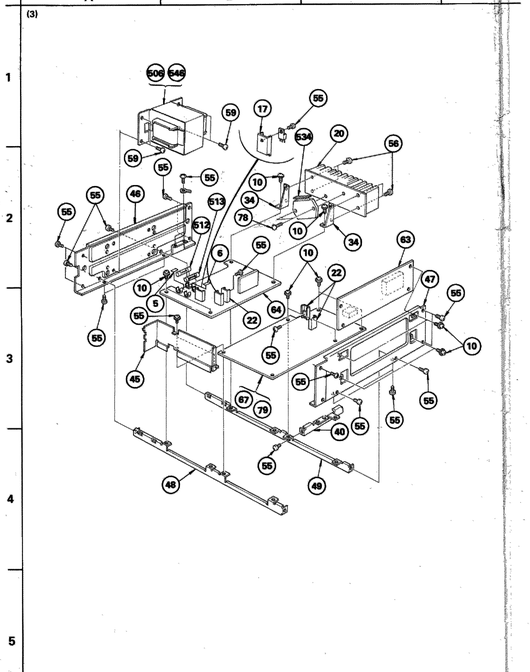
(1)



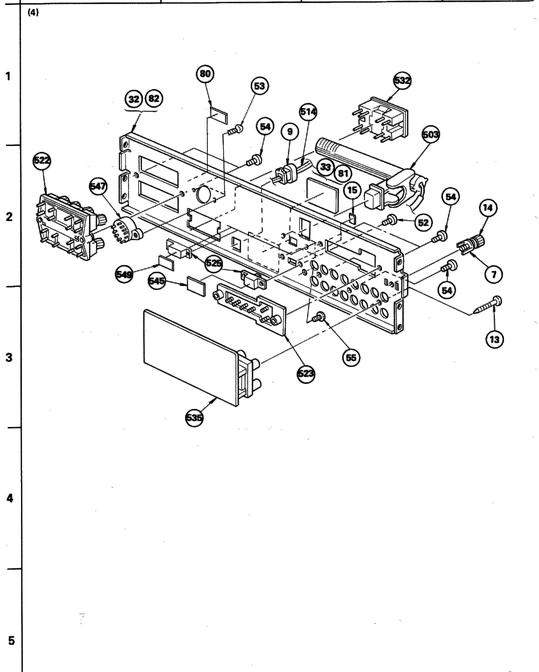
(2)



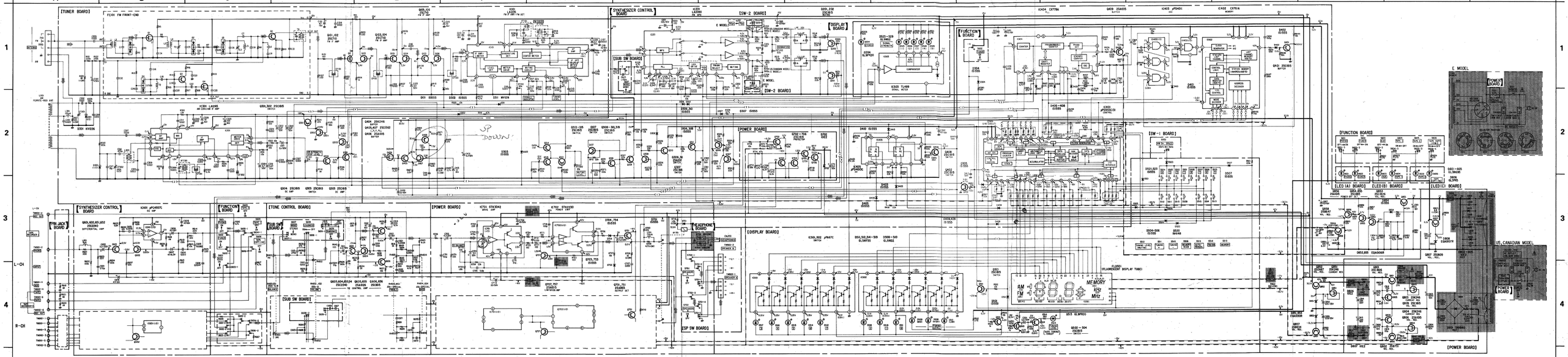
(3)



(4)



4-2. SCHEMATIC DIAGRAM



Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note:

- Components for right channel have same values as for left channel.
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, ¼ W unless otherwise noted. kΩ : 1000 Ω, MΩ : 1000 kΩ
- ▭▭▭ : nonflammable resistor.
- ▭▭▭ : fusible resistor.
- ➡ : signal path
- △ : internal component.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- ——— : B+ bus.
- - - - : B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal (detuned) conditions with a VOM (50 kΩ/V).
- ( ) : FM STEREO
- Voltage valations may be noted due to normal production tolerances.
- D520, 521 are diodes for FM IF OFFSET. According to the color of ceramic filters (CF101–103), it is clear which dioce is necessary. Refer to the figure below.

Colour of CF101–103	D520	D521
red	—	—
orange	used	—
blue	used	used

- Switch

Ref. No.	Switch	Position	Ref. No.	Switch	Position	Ref. No.	Switch	Position
S001	POWER	OFF	S513	MEMORY	–	S605	TAPE 2	OFF
S002	AM CH SPACE	9 kHz	S514	FM/AM	–	S606	TAPE COPY	OFF
S501~508	Preset 1 ~ 8	–	S515	AUTO/MANUAL	–	S607	MODE	STEREO
S509	MEMORY SCAN	–	S601	PHONO	OFF	S608	LOUDNESS	OFF
S510	TUNING –	–	S602	TUNER	ON	S609	SUBSONIC	OFF
S511	TUNING +	–	S603	AUX	OFF	S701	SPEAKERS A	ON
S512	TUNING LEVEL/MUNING	–	S604	TAPE 1	OFF	S702	SPEAKERS B	OF

GENERAL SECTION

No.	Part No.	Description
1	3-655-862-00	SPACER, INSRATING
2	.....	
3	.....	
4	.....	
5 ♦	3-701-946-25	LABEL, FUSE
6	3-701-946-30	LABEL, FUSE
7	3-701-993-00	SPACER, TERMINAL
8	3-703-079-21	(US)....LABEL, COURTION (BACK)
9	3-703-244-00	BUSHING, CORD
10	3-703-249-01	SCREW, S TIGHT, +PTTWH 3X6
11	3-703-354-11	SCREW (OS), CASE, CLAW
12	3-703-466-00	SPRING (6600)
13	3-703-473-00	SCREW, TERMINAL
14	3-706-165-00	SCREW
15 ♦	3-821-448-00	CUSHION (B), ORNAMENTAL STRIP
16	4-848-642-00	CUSHION, VIBRATION
17 ♦	4-861-002-11	HEAT SINK
18	4-864-307-00	RING
19	4-866-342-00	JOINT (B), KNOB
20 ♦	4-866-369-00	HEAT SINK
21 ♦	4-866-397-00	CUSHION, LED
22 ♦	4-866-647-00	HEAT SINK
23	.....	
24	.....	
25	4-874-058-41	KNOB, SQUARE (3X14)
26	4-875-152-00	KNOB, CONTROL
27	.....	
28	.....	
29	4-876-717-00	HOLDER (F), LED
30	4-876-722-01	KNOB (4X10), SPEAKERS
31	4-876-722-11	KNOB (4X10), SPEAKERS
32 ♦	4-877-103-00	(US,Canadian)...PLATE, JACK
33	4-877-108-00	(US).....LABEL, MODEL NUMBER
33	4-877-109-00	(Canadian)...LABEL, MODEL NUMBER
34 ♦	4-877-122-00	BRACKET (A), HEAT SINK
35 ♦	4-877-126-00	PANEL, SUB
36	4-877-127-01	KNOB (A)
37	4-877-128-01	KNOB (B)
38 ♦	4-877-132-00	BRACKET, JACK
39 ♦	4-877-134-00	SPRING, LEAF
40 ♦	4-877-135-00	CHANNEL (C)
41	4-877-137-00	WINDOW (A), INDICATOR
42	4-877-140-00	HOLDER (B), LED
43 ♦	4-877-141-00	HOUSE, LED
44	4-877-142-00	HOLDER, DIAL SCALE
45 ♦	4-877-144-00	PLATE (B), SHIELD

GENERAL SECTION

No.	Part No.	Description
46 ♦	4-877-147-00	PLATE (L), SIDE
47 ♦	4-877-148-00	PLATE (R), SIDE
48 ♦	4-877-149-00	CHANNEL (B)
49 ♦	4-877-150-00	CHANNEL (A)
50 ♦	4-877-154-00	PLATE, BOTTOM
51	4-877-155-00	CASE
52	7-621-255-25	SCREW +P 2X4
53	7-685-133-11	SCREW +P 2.6X6 TYPE1
54	7-685-646-11	SCREW +BVTP 3X8 TYPE2 N-S
55	7-685-871-01	SCREW +BVTT 3X6 (S)
56	7-685-872-01	SCREW +BVTT 3X8 (S)
57	7-685-873-01	SCREW +BVTT 3X10 (S)
58	7-685-875-01	SCREW +BVTT 3X14 (S)
59	7-685-880-01	SCREW +BVTT 4X6 (S)
60	9-911-845-XX	CUSHION
61	.....	
62	9-911-863-XX	SHEET, INSULATING
63 ♦	A-4382-083-A	MOUNTED PCB, TUNER
64	A-4388-270-A	MOUNTED PCB, POWER
65	A-4457-040-A	PLATE ASSY, ORNAMENTAL
66 ♦	A-4477-079-A	MOUNTED PCB, TONE CONTROL
67 ♦	A-4483-012-A	(US,Canadian)...MOUNTED PCB, CONTROL
68	X-3701-069-0	FOOT ASSY, M.F
69	X-4875-101-0	KNOB ASSY, PHONO
70	X-4875-102-0	KNOB ASSY, TUNER
71	X-4875-103-0	KNOB ASSY, AUX
72	X-4875-104-0	KNOB ASSY, TAPE (1)
73	X-4875-105-0	KNOB ASSY, TAPE (2)
74	X-4875-106-0	KNOB ASSY, TAPE COPY
75	X-4875-108-0	KNOB ASSY, POWER
76	X-4876-702-0	KNOB (DIA.40) ASSY, VOLUME
77	X-4877-103-1	PANEL ASSY, FRONT
78	7-685-649-11	SCREW +BVTP 3X14
79 ♦	A-4383-015-A	(E)....MOUNTED PCB, CONTROL
80	3-703-512-00	(E)....LABEL, VOLTAGE SELECT
81	4-877-112-00	(E1)...LABEL, MODEL NUMBER
81	4-877-113-00	(E2)...LABEL, MODEL NUMBER
82	4-877-105-11	(E)....PLATE, JACK

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS

- MMH : mH, UH : μH

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D803 ⚠	8-719-200-02	DIODE 10E-2
D804 ⚠	8-719-200-02	DIODE 10E-2
D805 ⚠	8-719-200-02	DIODE 10E-2
D806 ⚠	8-719-200-02	DIODE 10E-2
D807 ⚠	8-719-200-02	DIODE 10E-2
D808	8-719-910-71	DIODE HZ7A1L
D851	8-719-913-03	DIODE HZ30-3L
D852	8-719-910-62	DIODE HZ6A2L
D853	8-719-913-03	DIODE HZ30-3L
D854	8-719-815-55	DIODE 1S1555
D855	8-719-910-62	DIODE HZ6A2L
FE101	1-463-369-00	FN FRONT END
FLD501	1-519-212-21	INDICATOR TUBE, FLUORESCENT
IC101	8-759-812-35	IC LA1235
IC201	8-759-833-90	IC LA3390
IC301	8-759-812-45	IC LA1245
IC401	8-759-131-31	IC UPD553C131
IC402	8-757-611-00	IC CX-761A
IC403	8-759-140-11	IC UPD4011C
IC404	8-759-617-78	IC CX-778A
IC405	8-759-140-13	IC UPD4013C
IC501	8-759-100-67	IC UPA67C
IC502	8-759-100-67	IC UPA67C
IC503	8-759-904-89	IC TL489CP
IC601	8-759-145-57	IC UPC4557C
IC701	8-759-830-42	IC STK-3042
IC702	8-759-822-30	IC STK-2230
IFT301	1-404-326-00	TRANSFORMER, IF
L301	1-407-169-XX	MICRO INDUCTOR 100UH
L303	1-405-927-00	COIL, MW OSC
L601	1-407-519-00	INDUCTOR
L651	1-407-519-00	INDUCTOR
L701 ♦	1-420-838-00	COIL
L751 ♦	1-420-838-00	COIL
LPF201	1-235-062-00	FILTER, LOW PASS
Q101	8-729-671-14	TRANSISTOR 2SC710-14
Q102	8-729-671-14	TRANSISTOR 2SC710-14
Q103	8-729-671-14	TRANSISTOR 2SC710-14
Q104	8-729-671-14	TRANSISTOR 2SC710-14
Q105	8-729-671-14	TRANSISTOR 2SC710-14
Q106	8-729-671-14	TRANSISTOR 2SC710-14
Q201	8-729-663-47	TRANSISTOR 2SC1364
Q202	8-729-663-47	TRANSISTOR 2SC1364
Q301	8-729-663-47	TRANSISTOR 2SC1364

ELECTRICAL PARTS

Ref.No.	Part No.	Description
Q302	8-729-663-47	TRANSISTOR 2SC1364
Q303	8-729-663-47	TRANSISTOR 2SC1364
Q304	8-729-663-47	TRANSISTOR 2SC1364
Q305	8-729-663-47	TRANSISTOR 2SC1364
Q306	8-729-201-52	TRANSISTOR 2SA1015
Q307	8-729-663-47	TRANSISTOR 2SC1364
Q308	8-729-663-47	TRANSISTOR 2SC1364
Q309	8-729-663-47	TRANSISTOR 2SC1364
Q310	8-729-663-47	TRANSISTOR 2SC1364
Q311	8-729-201-52	TRANSISTOR 2SA1015
Q313	8-729-663-47	TRANSISTOR 2SC1364
Q314	8-729-663-47	TRANSISTOR 2SC1364
Q315	8-729-663-47	TRANSISTOR 2SC1364
Q319	8-729-663-47	TRANSISTOR 2SC1364
Q401	8-729-663-47	TRANSISTOR 2SC1364
Q402	8-729-663-47	TRANSISTOR 2SC1364
Q404	8-729-224-61	TRANSISTOR 2SK246
Q405	8-729-665-47	TRANSISTOR 2SC1362
Q406	8-729-201-52	TRANSISTOR 2SA1015
Q407	8-729-665-47	TRANSISTOR 2SC1362
Q408	8-729-663-47	TRANSISTOR 2SC1364
Q409	8-729-201-52	TRANSISTOR 2SA1015
Q501	8-729-245-83	TRANSISTOR 2SC2458
Q502	8-729-245-83	TRANSISTOR 2SC2458
Q503	8-729-245-83	TRANSISTOR 2SC2458
Q504	8-729-245-83	TRANSISTOR 2SC2458
Q601	8-729-140-02	TRANSISTOR 2SC1400
Q602	8-729-140-02	TRANSISTOR 2SC1400
Q603	8-729-140-02	TRANSISTOR 2SC1400
Q604	8-729-140-02	TRANSISTOR 2SC1400
Q605	8-729-612-77	TRANSISTOR 2SA1027R
Q606	8-729-245-83	TRANSISTOR 2SC2458
Q651	8-729-140-02	TRANSISTOR 2SC1400
Q652	8-729-140-02	TRANSISTOR 2SC1400
Q653	8-729-140-02	TRANSISTOR 2SC1400
Q654	8-729-140-02	TRANSISTOR 2SC1400
Q655	8-729-612-77	TRANSISTOR 2SA1027R
Q656	8-729-245-83	TRANSISTOR 2SC2458
Q701	8-729-201-52	TRANSISTOR 2SA1015
Q702	8-729-663-47	TRANSISTOR 2SC1364
Q703	8-729-663-47	TRANSISTOR 2SC1364
Q704	8-729-663-47	TRANSISTOR 2SC1364
Q705	8-729-663-47	TRANSISTOR 2SC1364
Q706	8-729-663-47	TRANSISTOR 2SC1364
Q707	8-729-201-52	TRANSISTOR 2SA1015

NOTE:
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- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS
- MMH : mH, UH : μH

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
Q751	8-729-201-52	TRANSISTOR 2SA1015				
Q757	8-729-201-52	TRANSISTOR 2SA1015				
Q801	8-729-398-62	TRANSISTOR 2SC1986				
Q802	8-729-173-13	TRANSISTOR 2SB731				
Q803	8-729-224-61	TRANSISTOR 2SK246				
Q804	8-729-224-61	TRANSISTOR 2SK246				
Q805	8-729-663-47	TRANSISTOR 2SC1364				
Q806	8-729-201-52	TRANSISTOR 2SA1015				
Q807	8-729-180-93	TRANSISTOR 2SD809				
Q851	8-729-224-61	TRANSISTOR 2SK246				
Q852	8-729-306-72	TRANSISTOR 2SD667-A				
Q853	8-729-398-62	TRANSISTOR 2SC1986				
Q854	8-729-663-47	TRANSISTOR 2SC1364				
Q855	8-729-663-47	TRANSISTOR 2SC1364				
Q856	8-729-201-52	TRANSISTOR 2SA1015				
Q857	8-729-283-42	TRANSISTOR 2SB834				
Q858	8-729-364-71	TRANSISTOR 2SB647-B				
R001 ⚠	1-202-725-00	SOLID	3.3M	10%	1/2W	
R120	1-244-945-00	CARBON	1M	5%	1/2W	
R301	1-244-891-00	CARBON	5.6K	5%	1/2W	
R469	1-244-883-00	CARBON	2.7K	5%	1/2W	
R705 ⚠	1-247-097-00	CARBON	39	5%	1/4W	F
R708	1-244-817-00	CARBON	4.7	5%	1/2W	
R709	1-244-825-00	CARBON	10	5%	1/2W	
R716	1-244-875-00	CARBON	1.2K	5%	1/2W	
R720 ⚠	1-247-097-00	CARBON	39	5%	1/4W	F
R721	1-206-660-00	METAL	680	5%	2W	F
R723 ⚠	1-247-107-00	CARBON	100	5%	1/4W	F
R771	1-206-660-00	METAL	680	5%	2W	F
R801 ⚠	1-247-192-00	CARBON	10	5%	1/2W	F
R802 ⚠	1-247-111-00	CARBON	150	5%	1/4W	F
R806 ⚠	1-247-188-00	CARBON	4.7	5%	1/2W	F
R807	1-244-821-00	CARBON	6.8	5%	1/2W	
R808 ⚠	1-206-646-00	METAL	180	5%	2W	F
R810 ⚠	1-247-083-00	CARBON	10	5%	1/4W	F
R811 ⚠	1-247-079-00	CARBON	4.7	5%	1/4W	F
R812 ⚠	1-206-646-00	METAL	180	5%	2W	F
R813	1-244-871-00	CARBON	820	5%	1/2W	
R862	1-244-839-00	CARBON	39	5%	1/2W	
R863 ⚠	1-206-646-00	METAL	180	5%	2W	F
R864	1-244-849-00	CARBON	100	5%	1/2W	
R865	1-244-861-00	CARBON	330	5%	1/2W	
RT101	1-226-235-00	RES, ADJ, CARBON 5K				
RT102	1-226-238-00	RES, ADJ, CARBON 50K				
RT201	1-226-236-00	RES, ADJ, CARBON 10K				

ELECTRICAL PARTS

Ref.No.	Part No.	Description
RT202	1-226-238-00	RES, ADJ, CARBON 50K
RT301	1-226-238-00	RES, ADJ, CARBON 50K
RT302	1-226-236-00	RES, ADJ, CARBON 10K
RT701	1-226-238-00	RES, ADJ, CARBON 50K
RT751	1-226-238-00	RES, ADJ, CARBON 50K
RV601	1-228-245-00	RES, VAR, CARBON 250K/250K
RV602	1-228-319-00	RES, VAR, CARBON 100K/100K
RV603	1-228-322-00	RES, VAR, CARBON (TREBLE)20K/20K
RV604	1-228-323-00	RES, VAR, CARBON (BASS)21K/21K
RV651	1-228-245-00	RES, VAR, CARBON 250K/250K
RV652	1-228-319-00	RES, VAR, CARBON 100K/100K
RV653	1-228-322-00	RES, VAR, CARBON (TREBLE)20K/20K
RV654	1-228-323-00	RES, VAR, CARBON (BASS)21K/21K
RY701	1-515-348-00	RELAY
S501	1-552-539-00	SWITCH, KEY BOARD
S502	1-552-539-00	SWITCH, KEY BOARD
S503	1-552-539-00	SWITCH, KEY BOARD
S504	1-552-539-00	SWITCH, KEY BOARD
S505	1-552-539-00	SWITCH, KEY BOARD
S506	1-552-539-00	SWITCH, KEY BOARD
S507	1-552-539-00	SWITCH, KEY BOARD
S508	1-552-539-00	SWITCH, KEY BOARD
S509	1-552-539-00	SWITCH, KEY BOARD
S510	1-552-539-00	SWITCH, KEY BOARD
S511	1-552-539-00	SWITCH, KEY BOARD
S512	1-552-539-00	SWITCH, KEY BOARD
S513	1-552-539-00	SWITCH, KEY BOARD
S514	1-552-539-00	SWITCH, KEY BOARD
S515	1-552-539-00	SWITCH, KEY BOARD
S601	1-553-787-00	SWITCH, PUSH (6 KEY)
S602	1-553-787-00	SWITCH, PUSH (6 KEY)
S603	1-553-787-00	SWITCH, PUSH (6 KEY)
S604	1-553-787-00	SWITCH, PUSH (6 KEY)
S605	1-553-787-00	SWITCH, PUSH (6 KEY)
S606	1-553-787-00	SWITCH, PUSH (6 KEY)
S607	1-553-786-00	SWITCH, PUSH (3 KEY)
S608	1-553-786-00	SWITCH, PUSH (3 KEY)
S609	1-553-786-00	SWITCH, PUSH (3 KEY)
S701	1-553-761-00	SWITCH, PUSH (2 KEY)
S702	1-553-761-00	SWITCH, PUSH (2 KEY)
TM901	1-507-637-21	JACK, PIN 6P
TM902	1-507-637-21	JACK, PIN 6P
X401	1-527-731-00	OSCILLATOR, CRYSTAL

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS
- MMH : mH, UH : μH

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTROLYTIC CAPACITORS

CAP. (μF)	RATING → : Use the high voltage rated one.					
	6.3 VOLT.	10 VOLT.	16 VOLT.	25 VOLT.	35 VOLT.	50 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.47					→	1-121-726-00
1.0					→	1-121-391-00
2.2					→	1-121-450-00
3.3	→	→	→	1-121-392-00	→	1-121-393-00
4.7	→	→	→	1-121-395-00	→	1-121-396-00
10	→	→	1-121-651-00	1-121-398-00	→	1-121-738-00
22	→	→	1-121-479-00	1-121-480-00	1-121-662-00	1-121-152-00
33	→	→	1-121-403-00	1-121-404-00	1-121-652-00	1-121-405-00
47	→	1-121-352-00	1-121-409-00	1-121-410-00	1-121-653-00	1-121-411-00
100	→	1-121-414-00	1-121-415-00	1-121-416-00	1-121-357-00	1-121-417-00
220	1-121-419-00	1-121-420-00	1-121-421-00	1-121-422-00	1-121-261-00	1-121-423-00
330	1-121-751-00	1-121-805-00	1-121-521-00	1-121-654-00	1-121-655-00	1-121-656-00
470	1-121-424-00	1-121-425-00	1-121-426-00	1-121-733-00	1-121-361-00	1-121-810-00
1000	–	1-121-736-00	1-121-245-00	1-121-657-00	1-121-388-00	1-123-061-00
2200	1-121-658-00	1-121-659-00	1-121-660-00	1-123-067-00	1-121-984-00	–
3300	1-121-661-00	1-123-075-00	1-123-071-00	–	–	–

CAP. (μF)	100 VOLT.	160 VOLT.	250 VOLT.	350 VOLT.
	PART No.	PART No.	PART No.	PART No.
0.47	–	–	–	–
1.0	1-123-249-00	1-123-252-00	1-123-003-00	1-121-168-00
2.2	1-123-250-00	1-123-026-00	–	1-123-028-00
3.3	1-121-995-00	–	1-123-004-00	1-123-006-00
4.7	1-123-255-00	1-121-246-00	1-121-759-00	1-123-007-00
10	1-121-126-00	1-121-999-00	1-123-254-00	1-123-008-00
22	1-121-996-00	1-123-253-00	1-123-005-00	1-123-022-00
33	1-121-997-00	1-121-757-00	–	–
47	1-123-251-00	1-121-919-00	–	–
100	1-123-084-00	–	–	–

CERAMIC CAPACITORS

CAP. (pF)	RATING							
	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (μF)	50 VOLT.
	PART No.		PART No.		PART No.		PART No.
0.5	1-101-837-00	22	1-102-959-00	150	1-101-361-00	0.001	1-102-074-00
0.75	1-101-586-00	24	1-102-960-00	160	1-101-367-00	0.0012	1-102-118-00
1.0	1-102-934-00	27	1-102-961-00	180	1-102-976-00	0.0015	1-102-119-00
1.5	1-101-576-00	30	1-102-962-00	200	1-102-977-00	0.0018	1-102-120-00
2.0	1-102-935-00	33	1-102-963-00	220	1-102-978-00	0.0022	1-102-121-00
3	1-102-936-00	36	1-102-964-00	240	1-102-979-00	0.0027	1-102-122-00
4	1-102-937-00	39	1-102-965-00	270	1-102-980-00	0.0033	1-102-123-00
5	1-102-942-00	43	1-102-966-00	300	1-102-981-00	0.0039	1-102-124-00
6	1-102-943-00	47	1-101-880-00	330	1-102-820-00	0.0047	1-102-125-00
7	1-102-944-00	51	1-101-882-00	360	1-102-821-00	0.0056	1-102-126-00
8	1-102-945-00	56	1-101-884-00	390	1-102-822-00	0.0068	1-102-127-00
9	1-102-946-00	62	1-101-886-00	430	1-102-823-00	0.0082	1-102-128-00
10	1-102-947-00	68	1-101-888-00	470	1-102-824-00	0.01	1-102-129-00
11	1-102-948-00	75	1-101-890-00	510	1-101-059-00	0.022	1-101-005-00
12	1-102-949-00	82	1-102-971-00	560	1-102-115-00	0.047	1-101-006-00
13	1-102-950-00	91	1-102-972-00	680	1-102-116-00		
15	1-102-951-00	100	1-102-973-00	820	1-102-117-00		
16	1-102-952-00	110	1-102-815-00				
18	1-102-953-00	120	1-102-816-00				
20	1-102-958-00	130	1-101-081-00				

0.001μF = 1,000pF

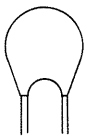
CERAMIC (SEMICONDUCTOR) CAPACITORS

CAP. (μF)	RATING → : Use the high voltage rated one.				
	25 VOLT.	50 VOLT.	CAP. (μF)	25 VOLT.	50 VOLT.
	PART No.	PART No.		PART No.	PART No.
0.001	→	1-161-039-00	0.018	1-161-016-00	1-161-054-00
0.0012	→	1-161-040-00	0.022	1-161-017-00	1-161-055-00
0.0015		1-161-041-00	0.027	1-161-018-00	1-161-056-00
0.0018		1-161-042-00	0.033	1-161-019-00	1-161-057-00
0.0022		1-161-043-00	0.039	1-161-010-00	1-161-058-00
0.0027	→	1-161-044-00	0.047	1-161-021-00	1-161-059-00
0.0033	→	1-161-045-00	0.056	→	1-161-060-00
0.0039	→	1-161-046-00	0.068	→	1-161-061-00
0.0047	→	1-161-047-00	0.082	1-161-024-00	1-161-062-00
0.0056	→	1-161-048-00	0.1	1-161-025-00	1-161-063-00
0.0068	→	1-161-049-00			
0.0082	1-161-012-00	1-161-050-00			
0.01	1-161-013-00	1-161-051-00			
0.012	→	1-161-052-00			
0.015	1-161-015-00	1-161-053-00			

MYLAR CAPACITORS

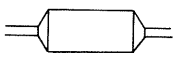
CAP. (μF)	RATING 50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.	CAP. (μF)	50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.	CAP. (μF)	50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.
0.001	1-108-227-00	1-108-365-00	1-108-409-00	0.01	1-108-239-00	1-108-377-00	1-108-421-00	0.1	1-108-251-00	1-108-389-00	1-108-433-00
0.0012	1-108-351-00	1-108-366-00	1-108-410-00	0.012	1-108-357-00	1-108-378-00	1-108-422-00	0.12	1-108-363-00	1-108-390-00	1-108-434-00
0.0015	1-108-228-00	1-108-367-00	1-108-411-00	0.015	1-108-240-00	1-108-379-00	1-108-423-00	0.15	1-108-252-00	1-108-391-00	1-108-435-00
0.0018	1-108-352-00	1-108-368-00	1-108-412-00	0.018	1-108-358-00	1-108-380-00	1-108-424-00	0.18	1-108-364-00	1-108-392-00	1-108-436-00
0.0022	1-108-230-00	1-108-369-00	1-108-413-00	0.022	1-108-242-00	1-108-381-00	1-108-425-00	0.22	1-108-254-00	1-108-393-00	1-108-437-00
0.0027	1-108-353-00	1-108-370-00	1-108-414-00	0.027	1-108-359-00	1-108-382-00	1-108-426-00	0.27	1-108-854-00	–	–
0.0033	1-108-232-00	1-108-371-00	1-108-415-00	0.033	1-108-244-00	1-108-383-00	1-108-427-00	0.33	1-108-855-00	–	–
0.0039	1-108-354-00	1-108-372-00	1-108-416-00	0.039	1-108-360-00	1-108-384-00	1-108-428-00	0.39	1-108-856-00	–	–
0.0047	1-108-234-00	1-108-373-00	1-108-417-00	0.047	1-108-246-00	1-108-385-00	1-108-429-00	0.47	1-108-857-00	–	–
0.0056	1-108-355-00	1-108-374-00	1-108-418-00	0.056	1-108-361-00	1-108-386-00	1-108-430-00				
0.0068	1-108-237-00	1-108-375-00	1-108-419-00	0.068	1-108-249-00	1-108-387-00	1-108-431-00				
0.0082	1-108-356-00	1-108-376-00	1-108-420-00	0.082	1-108-362-00	1-108-388-00	1-108-432-00				

TANTALUM CAPACITORS



CAP. (μF)	RATING 3.15 VOLT. PART No.	6.3 VOLT. PART No.	10 VOLT. PART No.	16 VOLT. PART No.	20 VOLT. PART No.	25 VOLT. PART No.	35 VOLT. PART No.
							→: Use the high voltage rated one.
0.01					→	→	1-131-396-00
0.015						→	1-131-397-00
0.022						→	1-131-398-00
0.033						→	1-131-399-00
0.047						→	1-131-400-00
0.068					→	→	1-131-401-00
0.1					→	→	1-131-402-00
0.15					→	→	1-131-403-00
0.22					→	→	1-131-404-00
0.33					→	1-131-409-00	1-131-405-00
0.47	–	–	–	–	1-131-412-00	→	1-131-406-00
0.68	–	–	–	1-131-415-00	→	1-131-410-00	1-131-407-00
1.0	–	–	1-131-418-00	–	1-131-413-00	→	1-131-408-00
1.5	–	1-131-421-00	–	1-131-416-00	→	1-131-411-00	1-131-348-00
2.2	1-131-424-00	–	1-131-419-00	–	1-131-414-00	1-131-355-00	1-131-349-00
3.3	–	1-131-422-00	–	1-131-417-00	1-131-362-00	1-131-356-00	1-131-350-00
4.7	1-131-425-00	–	1-131-420-00	1-131-369-00	1-131-363-00	1-131-357-00	1-131-351-00
6.8	–	1-131-423-00	1-131-376-00	1-131-370-00	1-131-364-00	1-131-358-00	1-131-352-00
10	1-131-426-00	1-131-383-00	1-131-377-00	1-131-371-00	1-131-365-00	1-131-359-00	1-131-353-00
15	1-131-390-00	1-131-384-00	1-131-378-00	1-131-372-00	1-131-366-00	1-131-360-00	–
22	1-131-391-00	1-131-385-00	1-131-379-00	1-131-373-00	1-131-367-00		
33	1-131-392-00	1-131-386-00	1-131-380-00	1-131-374-00			
47	1-131-393-00	1-131-387-00	1-131-381-00	–			
68	1-131-394-00	1-131-388-00	–	–			
100	1-131-395-00	–	–	–			

TANTALUM CAPACITORS



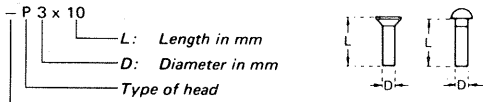
CAP. (μF)	RATING 3 VOLT. PART No.	6.3 VOLT. PART No.	10 VOLT. PART No.	16 VOLT. PART No.	20 VOLT. PART No.	35 VOLT. PART No.
0.033						1-131-273-00
0.047						1-131-274-00
0.068						1-131-275-00
0.1						1-131-276-00
0.15						1-131-277-00
0.22			–	–	1-131-262-00	1-131-278-00
0.33			–	–	1-131-263-00	1-131-279-00
0.47			1-131-169-00	–	1-131-264-00	1-131-280-00
0.68			–	1-131-258-00	1-131-265-00	1-131-281-00
1.0			1-131-254-00	–	1-131-266-00	1-131-282-00
1.5		1-131-250-00	–	–	1-131-267-00	1-131-283-00
2.2		–	–	1-131-259-00	1-131-268-00	1-131-284-00
3.3		–	1-131-255-00	–	1-131-269-00	–
4.7		1-131-251-00	1-131-171-00	–	1-131-270-00	–
6.8		–	–	1-131-260-00	1-131-271-00	–
10	–	–	1-131-256-00	–	1-131-272-00	–
15	–	1-131-252-00	–	1-131-261-00		
22	–	–	1-131-257-00	–		
33	1-131-176-00	1-131-253-00	1-131-173-00	–		
47	1-131-288-00	1-131-174-00	–	–		
100	1-131-177-00					

1/4 WATT CARBON RESISTORS

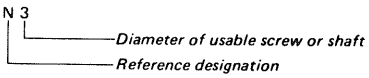
Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-476-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-477-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-478-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-479-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-480-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-481-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-482-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-483-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-484-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-485-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-486-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-487-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

HARDWARE NOMENCLATURE

Screw:



Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
		SCREWS	
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
		SELF-TAPPING SCREWS	
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
		SET SCREWS	
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
		NUT	
N		nut	
		WASHERS	
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
		RETAINING RINGS	
E		retaining ring	
G		grip-type retaining ring	

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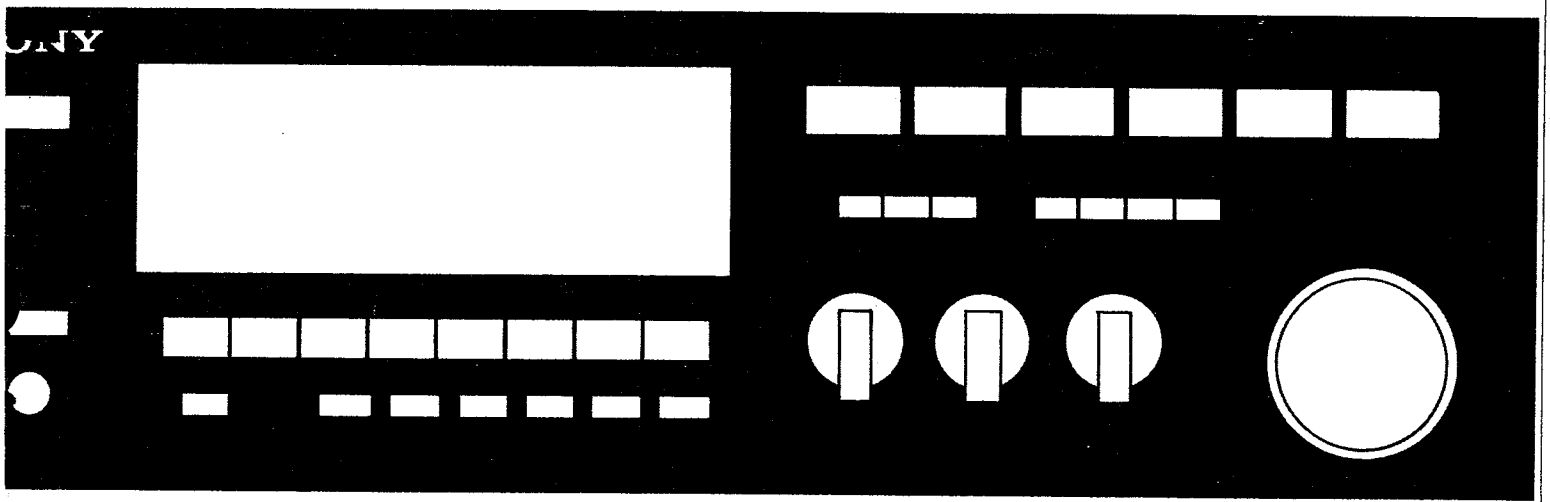
SONY®

Service Division

STEREO RECEIVERS

Models

STR-VX6, -VX5, -VX4, -VX3, -VX2, -VX1



circuit operation

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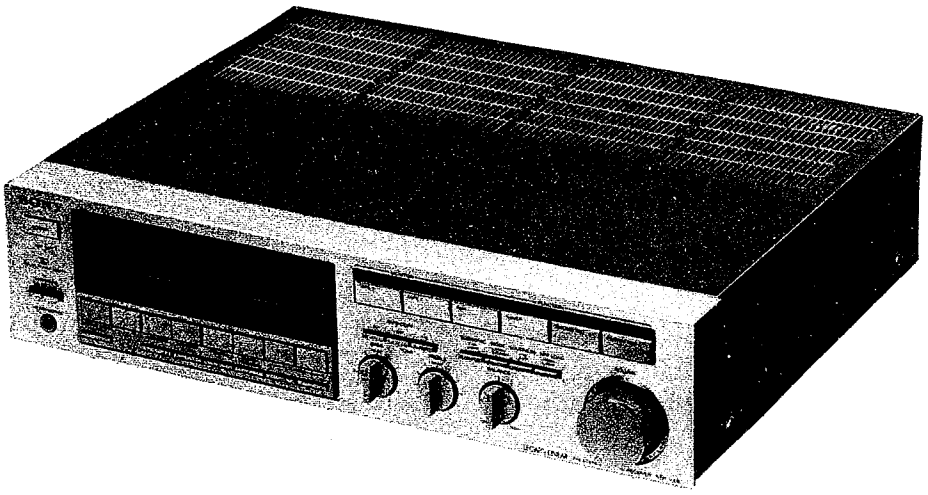
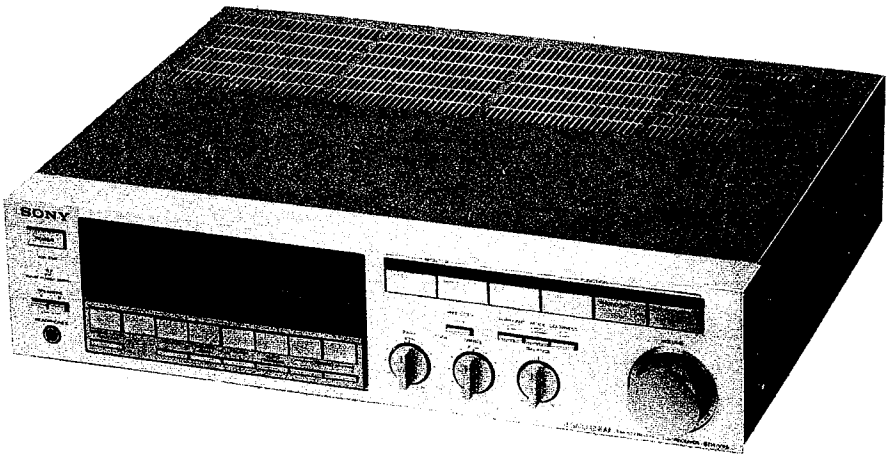
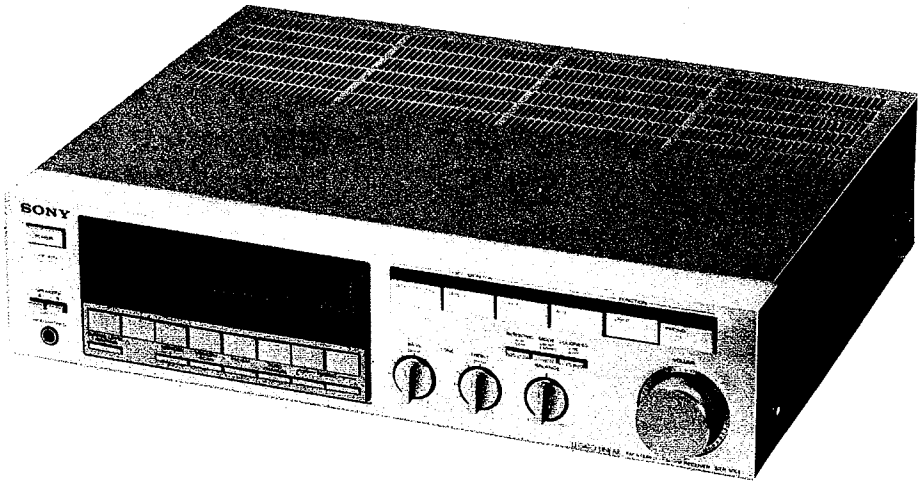


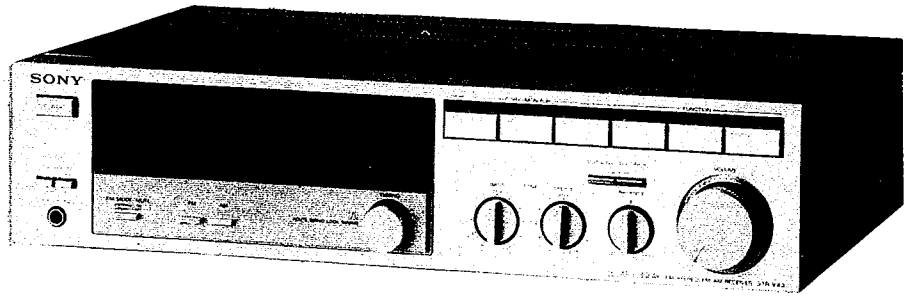
STR-VX6

STR-VX5



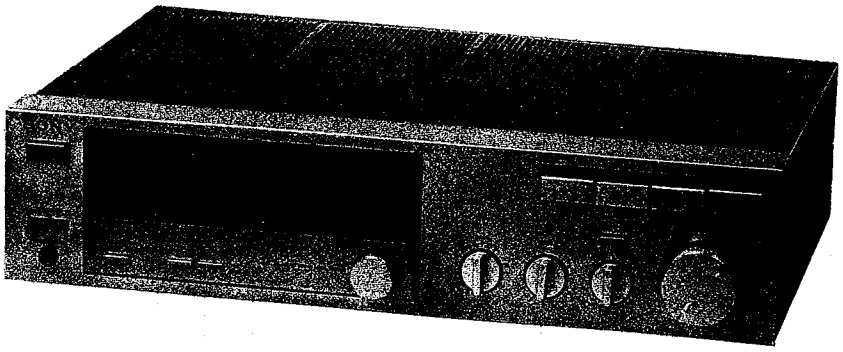


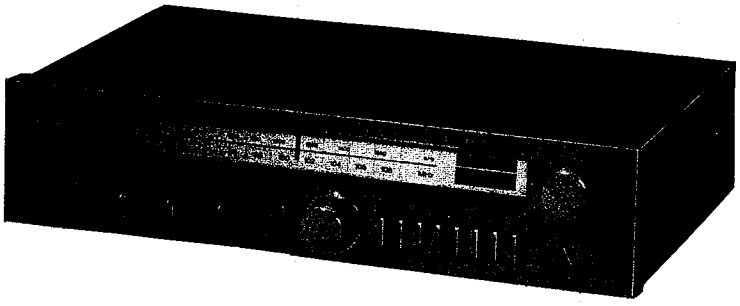
STR-VX4



STR-VX3

STR-VX2





STR-VX1

General Description

The STR-VX series is slightly different from the former STR-V stereo receiver series. The STR-VX series lineup is composed of six receivers from the STR-VX1 to the STR-VX6. The STR-VX6 is the top of the series, and employs a pulse power supply, Legato linear power amplifier, a 70-watt per channel amplifier, and a new PLL integrated circuit in the AM/FM tuner. Table 1 shows a comparison of the STR-VX series.

Table 1. STR-VX Series Comparison Chart

Feature	STR-VX6	STR-VX5	STR-VX4	STR-VX3	STR-VX2	STR-VX1
Output power per channel	70 W	55 W	40 W	35 W	28 W	22 W
DC amplifier & Legato Linear	yes	yes	yes	yes	---	---
Tuning system	PLL synthe-sizer	PLL synthe-sizer	PLL synthe-sizer	Acute Servo Lock	Acute Servo	Program Sensor
Auto tuning/memory scan	yes	yes	yes	---	---	---
Memory preset station	8(FM,AM)	8(FM,AM)	8(FM,AM)	---	---	5(FM)
Auto tuning level sensor	yes	yes	yes	---	---	---
Direct comparator	yes	yes	---	---	---	---
MC phono input	yes	yes	---	---	---	---
MM load selector	yes	---	---	---	---	---
Solid-state switch	yes	yes	---	---	---	---
Pulse power supply	yes	yes	---	---	---	---
Heat pipe	yes	---	---	---	---	---
Pre-out/main-in terminal	yes	---	---	---	---	---

Audio Section

STR-VX1, -VX2, -VX3, -VX4 Phono Equalizer

The entire phono equalizer section in the STR-VX1 and -VX2 is built around a high-performance integrated circuit. The STR-VX3 and -VX4 employ two transistors in a differential configuration before the integrated circuit to obtain a high signal-to-noise ratio (Figure 1).

STR-VX5, -VX6 Phono Equalizer

The basic circuitry in the STR-VX5 and -VX6 are identical to the STR-VX3 and -VX4. However, the STR-VX5 and -VX6 feature input capability for both moving-coil (MC) and moving-magnet type (MM) cartridges (Figure 2). The MC function is obtained by shorting R622 with the relay switch S602, and by reducing the input resistance to 100 ohms by S601. When the MC mode switch is depressed, DC voltage appears from the control circuit. This voltage is reduced by R821 and R824 and fed to the base of Q821 via R823. Then Q821 turns on to energize relay RY601 to close switches S601 and S602.

The STR-VX6 also features an input capacitance selector switch (180pF/330pF) for the MM cartridges by adding R649, C601 and S601-1.

STR-VX1, -VX2 Main Tone Amplifier

The STR-VX1 and -VX2 do not have separated tone and power amplifiers. The STR-VX1 and -VX2 employ a main amplifier with the tone control circuitry incorporated in the negative feedback loop. Because the power integrated circuits (STK-460 for the STR-VX1;

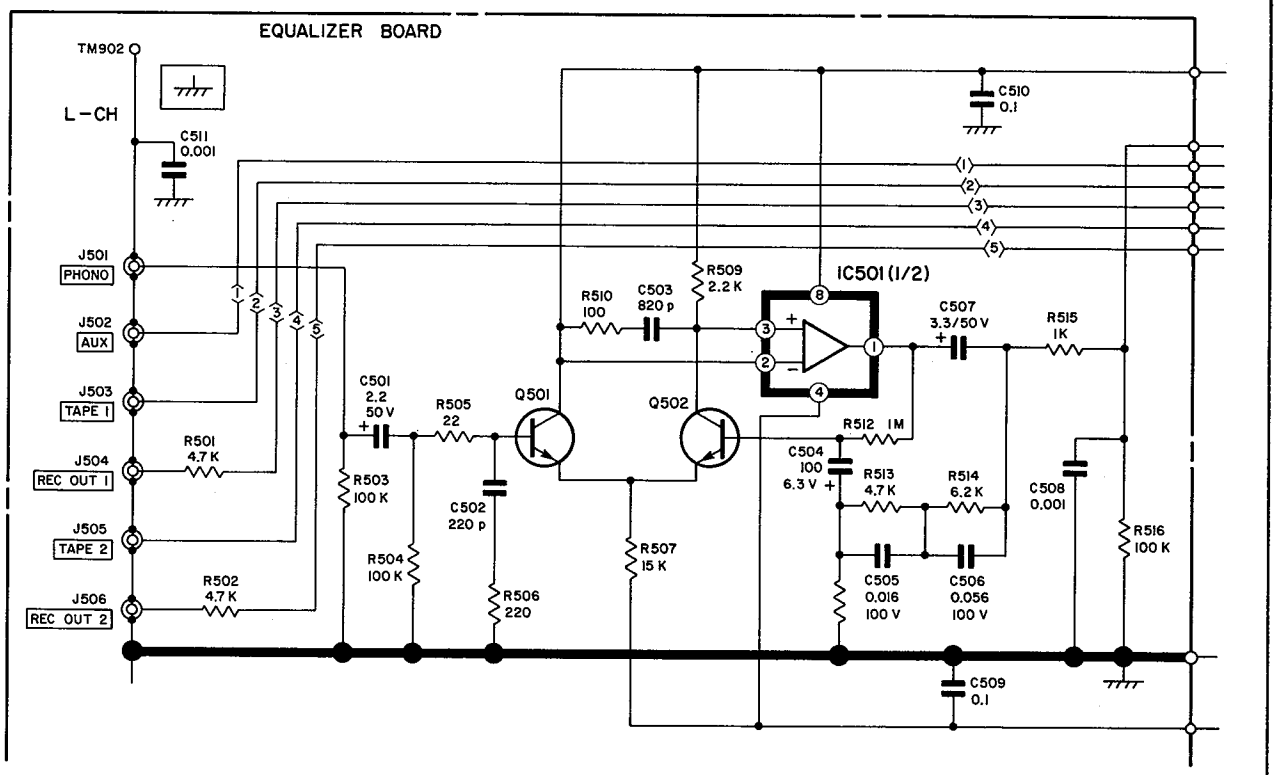


Fig. 1. STR-VX3 Phono Amplifier (Left Channel).

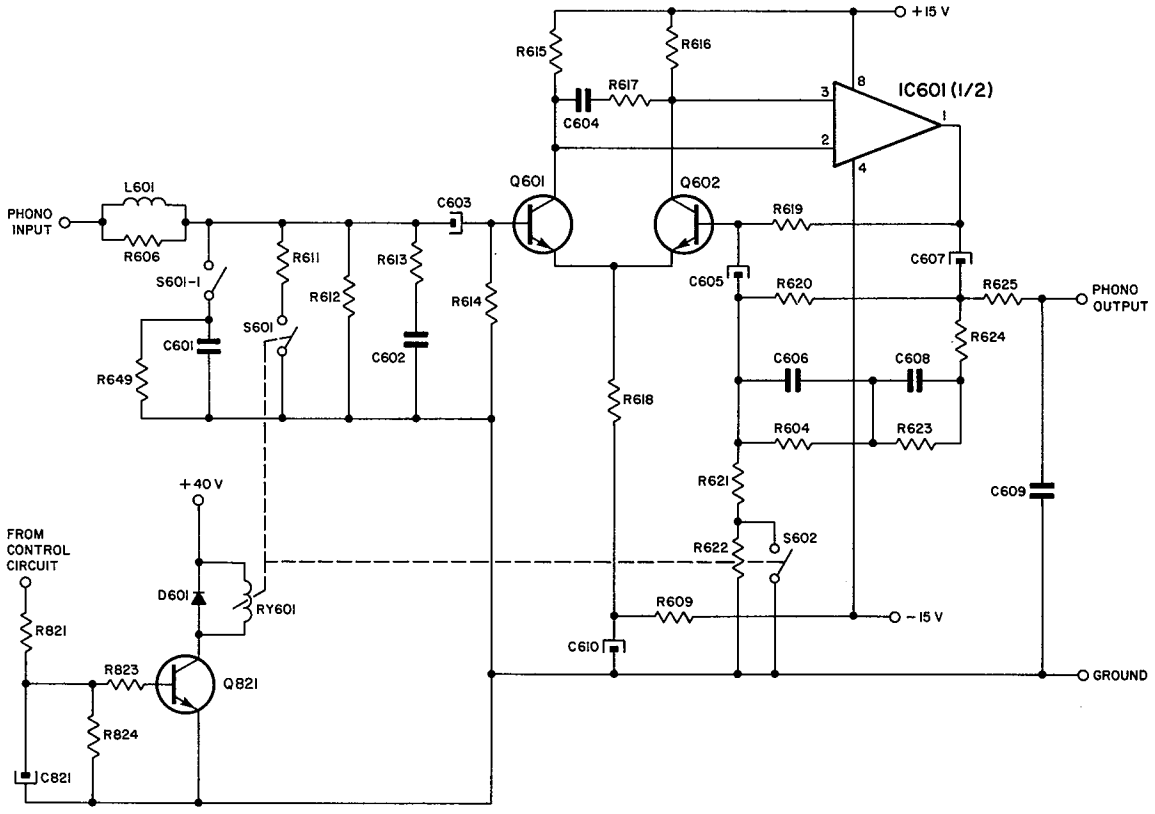


Fig. 2. STR-VX6 Phono Amplifier (Left Channel).

STK-463 for the STR-VX2) have high open-loop gain, when negative feedback is applied, noise and distortion will be reduced. Figure 3 shows the left channel main tone amplifier circuit of the STR-VX1. The simplified version of this circuit is shown in Figure 4. The negative feedback loop between pins 6, 7, and 2 is divided into two parts. The DC negative feedback is determined by R609, R608, and C605. AC negative feedback is determined by all peripheral components. By changing the amount of AC negative feedback with the variable resistors (RV604, RV605), we obtain the desired tone control response. C613 and R616 compensate for flatness at low frequencies. C606 is connected to prevent the tone control elements from affecting the DC negative feedback. C604, C609, R607, R613, C607, C608, R611 and R606 are the peripheral elements to make the circuit stable.

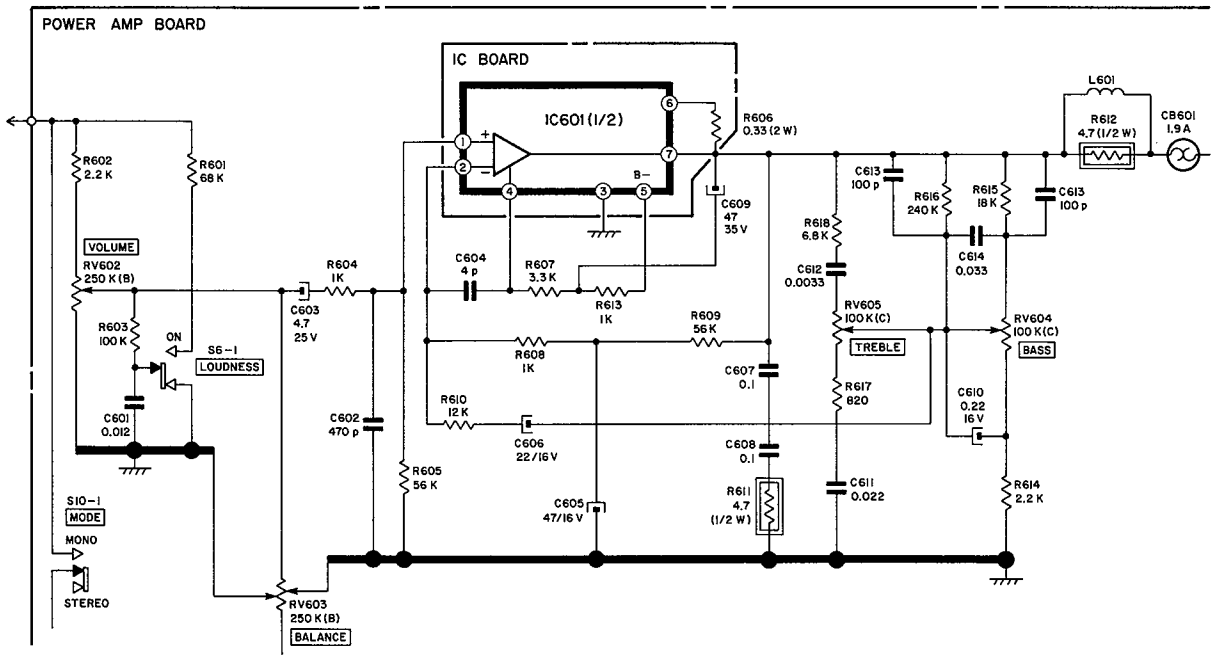


Fig. 3. STR-VX1 Main Tone Amplifier (Left Channel).

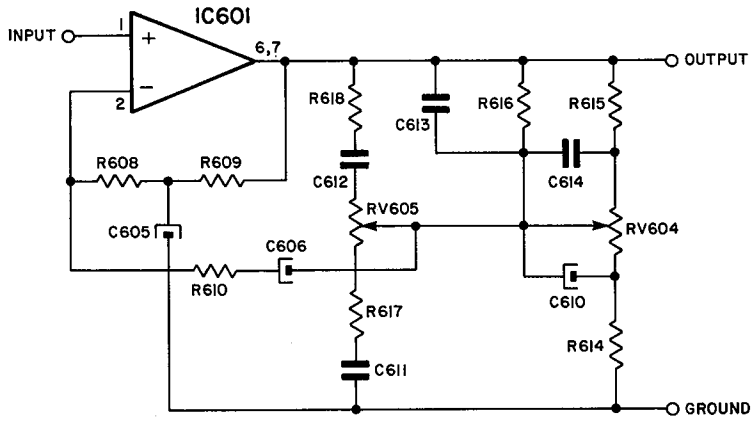


Fig. 4. Simplified Circuit of Fig. 3.

STR-VX3 Tone Amplifier

Like the STR-VX1 and -VX2, the whole control circuitry is built around the operational amplifier NJM4560D (IC601, Figure 5), which is connected in a non-inverting configuration with bass and treble controls incorporated in the negative feedback loop. The STR-VX3 features a subsonic filter that cuts the noise by 12 dB per octave below 15 Hz. This is to eliminate such very low frequency noise as the rumble produced by phono records. Figure 6 shows the simplified subsonic filter circuit of the STR-VX3. When the subsonic filter switch (S6-1) is depressed, the circuit operates as a two-stage high-pass filter (Figure 6b).

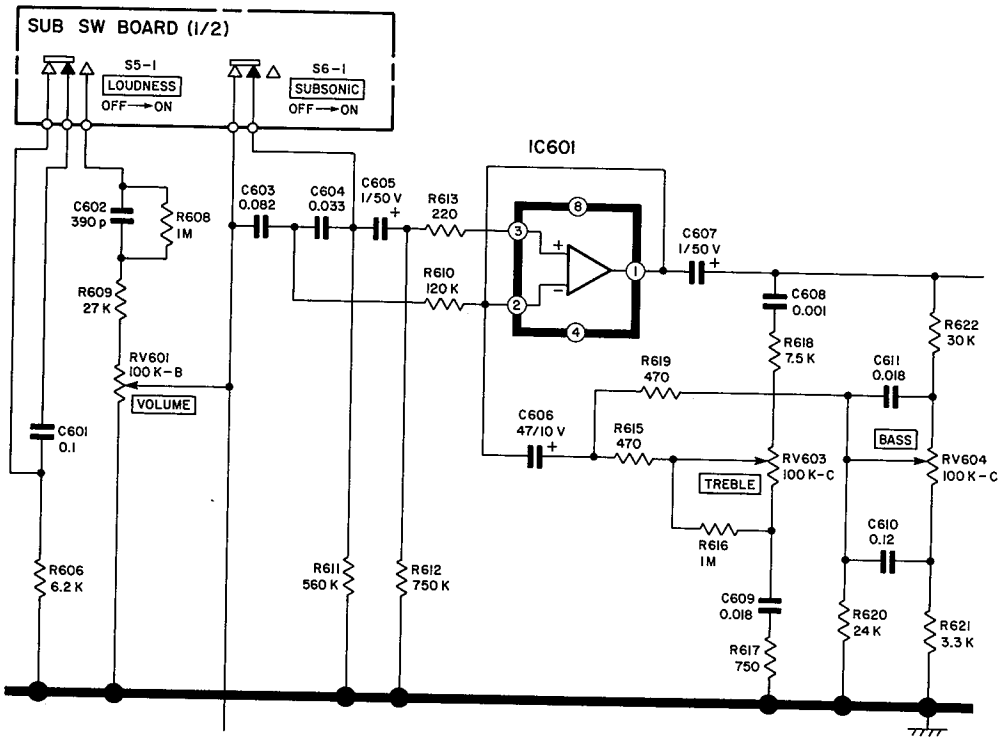


Fig. 5. STR-VX3 Tone Amplifier (Left Channel).

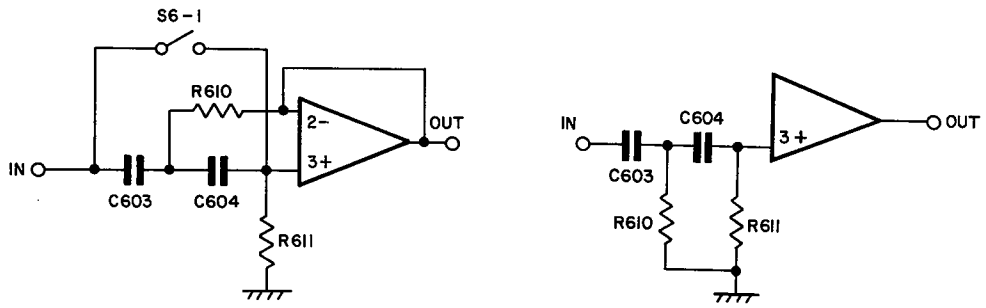


Fig. 6. STR-VX3 Simplified Subsonic Filter Circuit.

STR-VX4, -VX5, -VX6 Tone Amplifier

Four discrete transistors are employed in the tone amplifier (Figure 7). Q603 and Q604 are connected in a differential configuration to eliminate the common-mode noise coming from B+/B- line. Q605 further amplifies the voltage signal coming from Q603. Q606 acts as a constant-current load for Q605. The bass and the treble controls are connected in the negative feedback loop. The STR-VX4, -VX5 and -VX6 also have subsonic filter circuitry. The operation of the circuit is identical to that of the STR-VX3. The STR-VX6, which is the top model of the STR-VX series, features pre-out/main-in terminals for expanded utility.

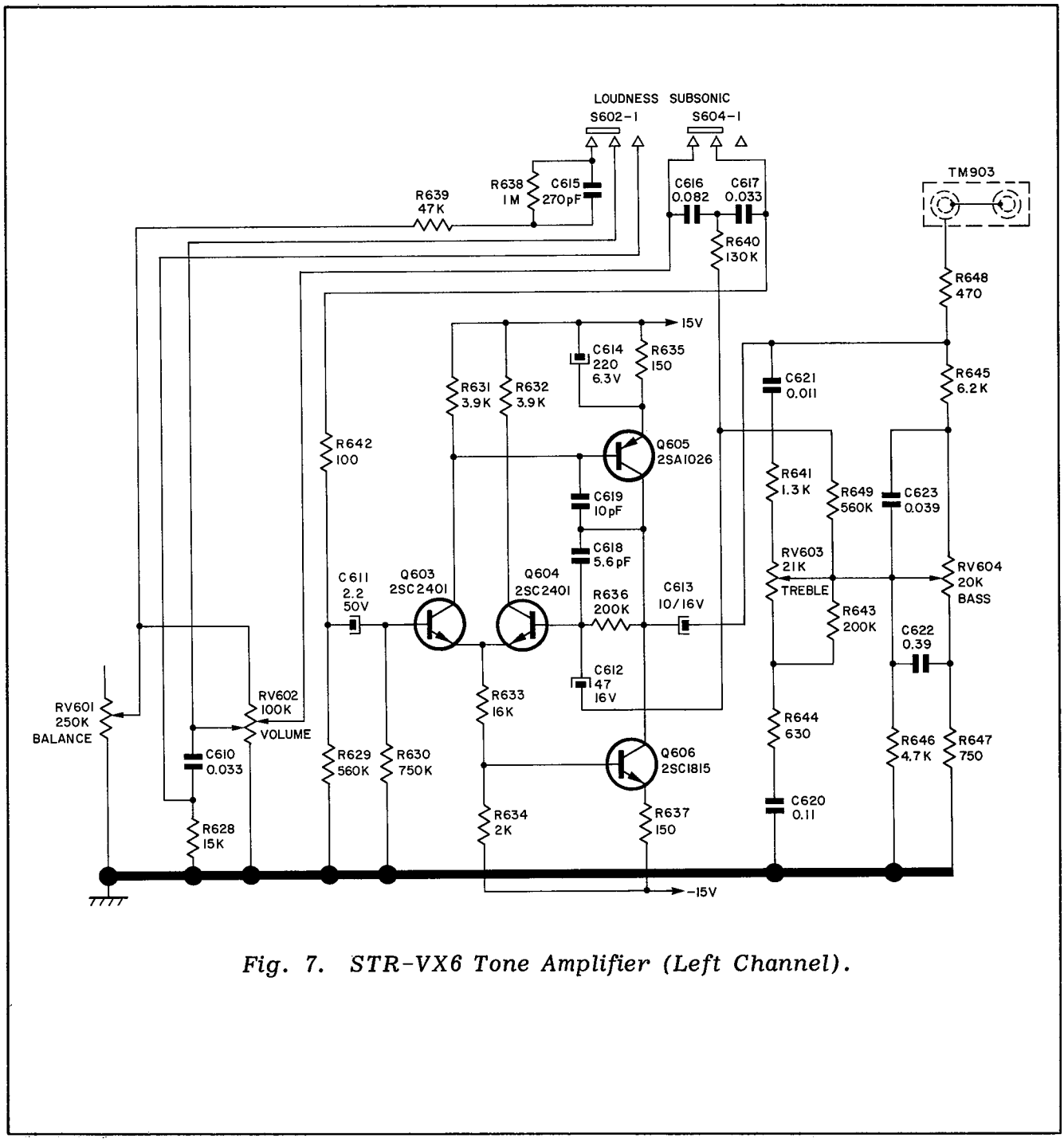


Fig. 7. STR-VX6 Tone Amplifier (Left Channel).

STR-VX3, -VX4 Power Amplifier

These two models employ two kinds of integrated circuits. The STK-3042II is a voltage amplifier, and the STK-2230 is a current amplifier (Figure 8). Both integrated circuits contain two channels.

Unlike the power integrated circuit built on one chip, the voltage amplifiers and current amplifiers are separate. This isolates the magnetic flux and provides low noise and distortion. The DC offset voltage is adjustable with the semivariable resistors RT701 and RT751, but the idling current is fixed internally.

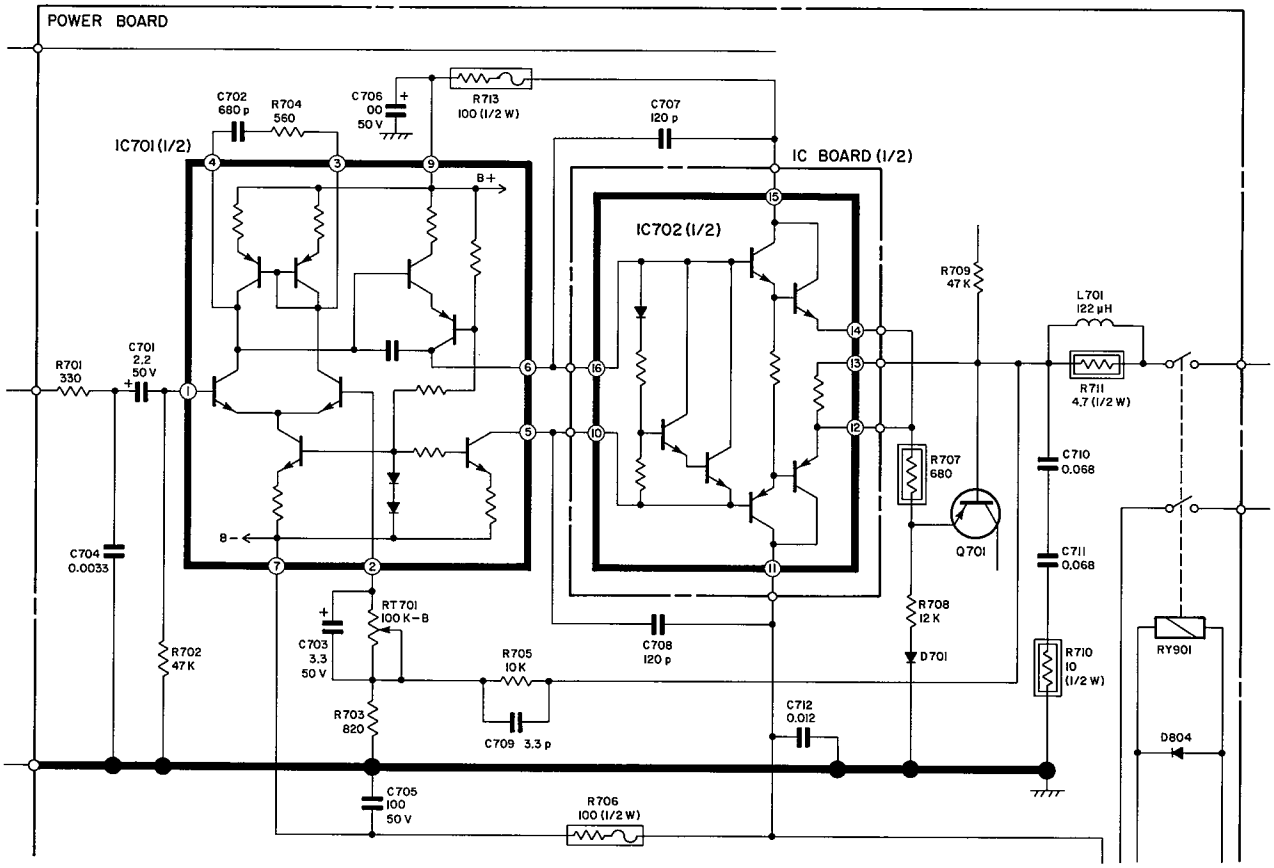


Fig. 8. STR-VX3 Power Amplifier (Left Channel).

STR-VX5, -VX6 Power Amplifier

The left-channel power amplifier circuit of the STR-VX5 is shown in Figure 9. In the first stage, a dual PNP transistor (Q702) is connected to a dual NPN transistor (Q701) as a current mirror for high voltage gain. The DC offset voltage can be zeroed by RV701 if slight DC imbalances occur. The second stage, which consists of Q703 and Q704, supplies more voltage gain. The base-emitter voltage of Q705 is regulated by D701, D704, and R717. Q705 acts as a regulated current source for Q703 and Q704. D702, which is a varistor consisting of four diodes connected in series, biases the output stage in class AB mode to reduce crossover distortion. The bias current is adjustable by RV702. The complementary output stage consists of Q706, Q707, Q708 and Q709.

The power amplifier of the STR-VX6 is nearly identical to that of the STR-VX5, except for the absence of an input capacitor, and a dual FET (Q701), which configures a DC amplifier. Q703 and Q704 are connected between Q701 and the current mirror Q702 to reduce high-frequency distortion caused by the gate-drain capacitance of Q701. Q705, D701, D702 and R710 are a regulated current source for Q701, and the DC offset voltage is adjustable by RV701. Current gain is supplied by Q710, Q711, Q712, Q713, Q714, and Q715, which are connected in a three-stage Darlington arrangement.

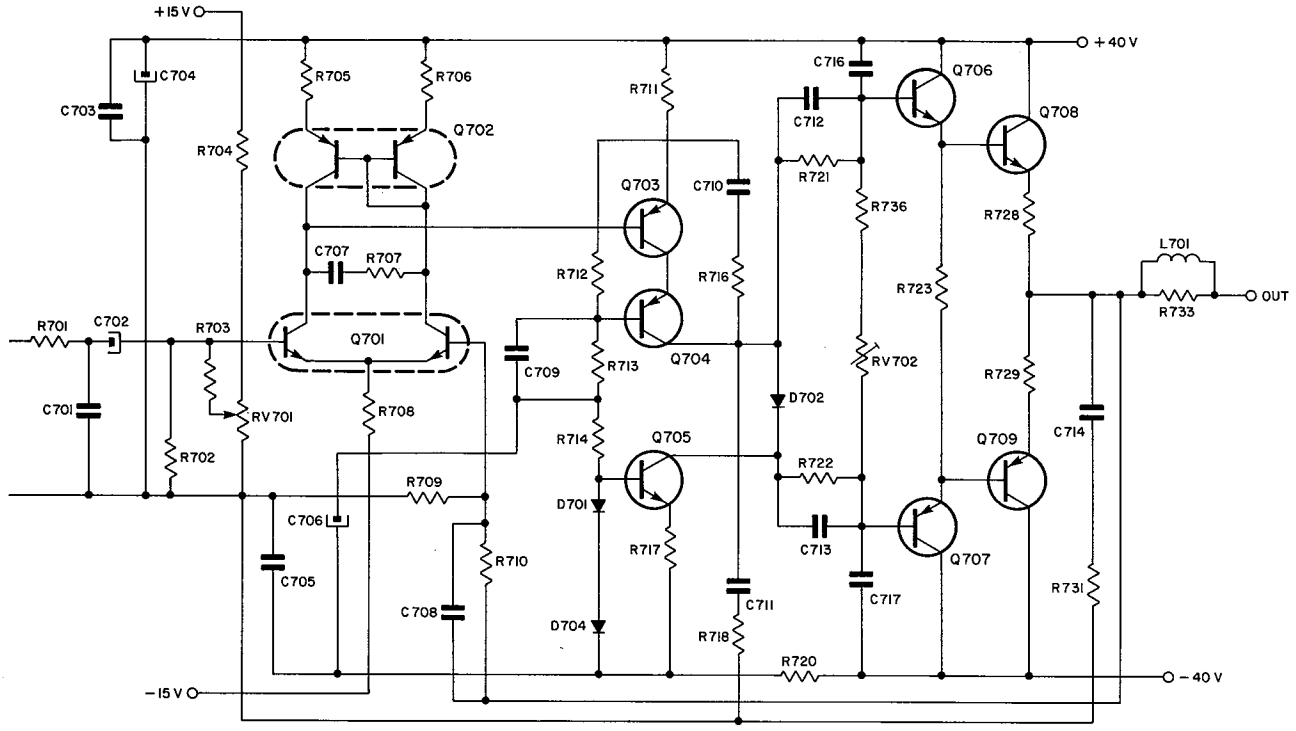


Fig. 9. STR-VX5 Power Amplifier (Left Channel).

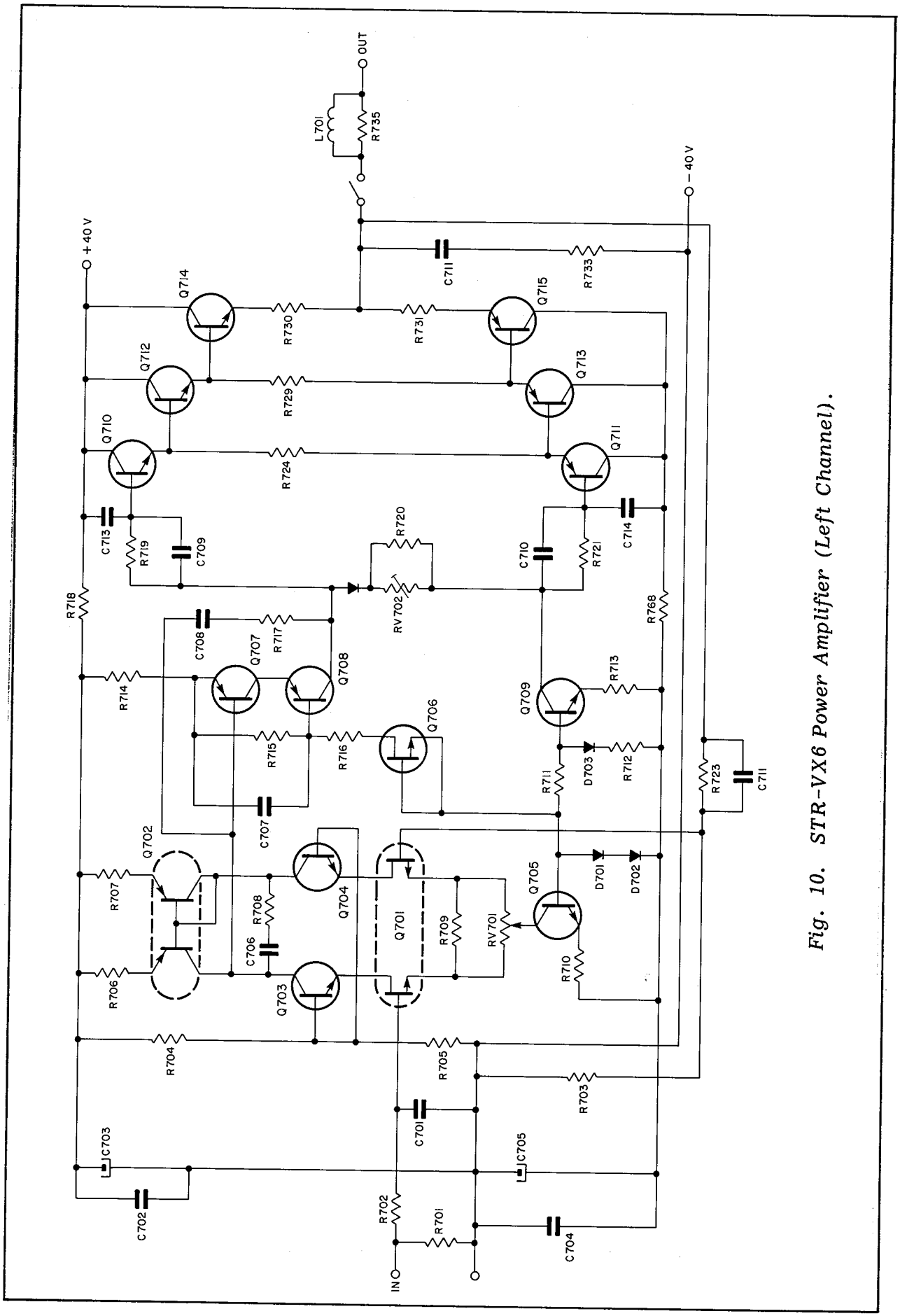


Fig. 10. STR-VX6 Power Amplifier (Left Channel).

Power Supply (all models)

The STR-VX1, -VX2 and -VX4 employ conventional power supplies. The STR-VX5 and -VX6 employ pulse power supplies. The configuration of the pulse power supply is identical to that of previous models, and will not be discussed here.

STR-VX3, -VX4, -VX5 and -VX6 Protection Circuit

Table 2 summarizes the protection circuit employed in each model. The protection circuits used in the STR-VX6 will be discussed here.

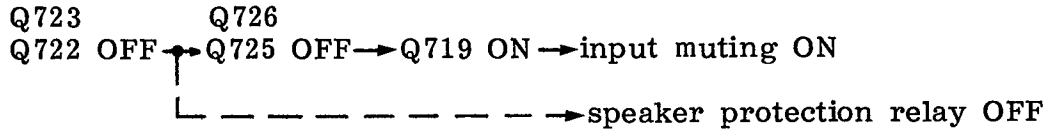
Table 2.

	STR-VX6	-VX5	-VX4	-VX3	-VX2	-VX1
Speaker Protection	relay	relay	relay	relay	circuit breaker (1.9A)	circuit breaker (1.9A)
Current Limiter	Yes	Yes	Yes	No	No	No
DC Voltage Detector	Yes	Yes	Yes	Yes	No	No
Impedance Detector	Yes	Yes	Yes	Yes	No	No
B+ Detector	Yes	Yes	Yes	Yes	No	No
Input Muting	Yes	No	No	No	No	No
Primary Fuse or Circuit Breaker	5A	5A	3.15A	2.5A	2A	2A
In-Rush Current Relay	Yes	Yes	No	No	No	No

Speaker Protection Relay Drive and Input Muting

A relay is employed to protect both the speakers and the amplifier itself. The following events take place when the power switch is turned on or turned off. Refer to Figure 11.

1. Immediately after power switch is turned on



2. Several seconds after power switch is turned on

   Base-emitter voltage of Q722 rises to 0.6V.

   Q723 Q726
   Q722 ON → Q725 ON → Q719 OFF → input muting OFF
   → speaker protection relay ON

3. Power switch is turned off

   Q723 Q726
   Q722 OFF → Q725 OFF → Q719 ON (momentarily) → input muting ON (momentarily)
   → speaker protection relay OFF

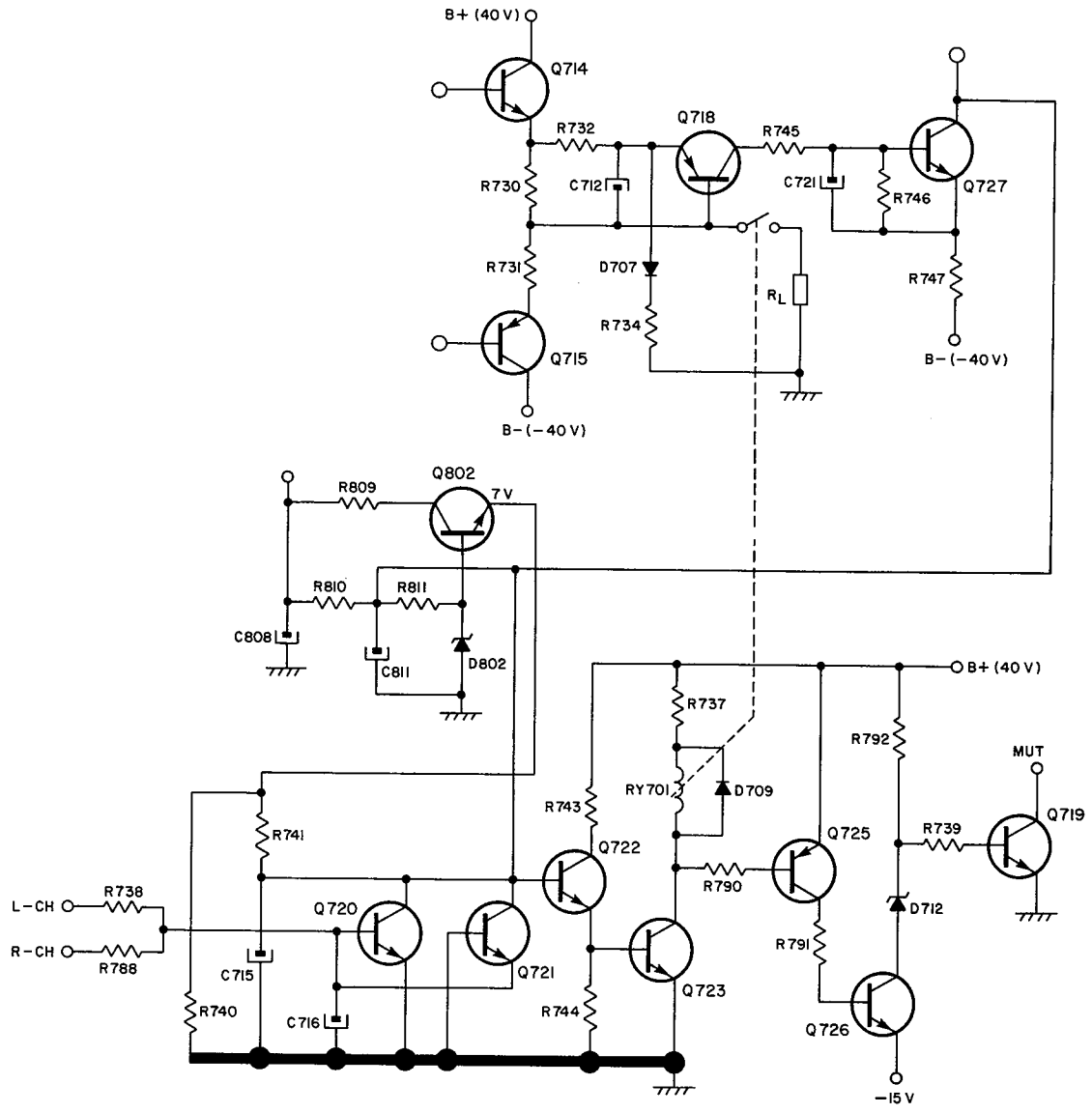


Fig. 11. Relay Drive, Input Muting and Impedance Detector Circuit.

Impedance Detector

The circuit feeds a signal to the relay drive circuit to open the relay switch in order to protect the speakers if excess current flows in the output stage. When the base-emitter voltage of Q718 is raised to 0.6V, Q727 turns on. Then, the collector voltage of Q727 goes low. Because the collector of Q727 is connected to the base of Q722, Q722 turns off, disengaging the relay switch as shown in Figure 11.

Current Limiter

When a very low impedance speaker is connected or extremely high output current flows in the output stage, the current limiter operates to protect the amplifier. If the base-emitter voltage of Q716 is raised to 0.6V because of an excessive voltage drop across R730, Q716 turns on, and the voltage between points A and B will become about 0.6V as shown in Figure 12. This cuts off the driver transistors (Q710, Q712) and output transistor Q714. Likewise, if the base-emitter voltage of Q717 is raised to 0.6V via R728 from R731, Q717 turns on. Then Q711, Q713 and Q715 switch off. D705 and D706 are connected to prevent current from flowing from the output to the input of the driver stage via Q716 and R727, or Q717 and R728.

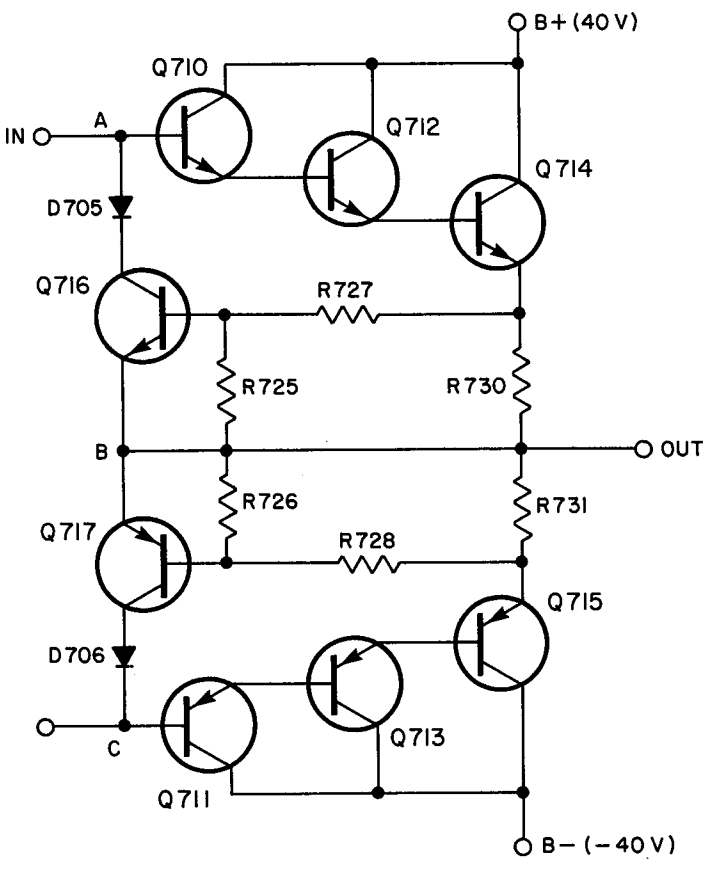


Fig. 12. Current Limiter.

STR-VX5, -VX6 Electronic Switch

The STR-VX5 and -VX6 employ electronic switches for the input function selectors. An integrated circuit (CX-770) contains 6 of these CMOS analog switches as shown in Figure 13. As the switches are remotely controlled by a DC voltage, the input function selectors can be located near the input terminals. This means that there is less hum and noise pickup from long wires.

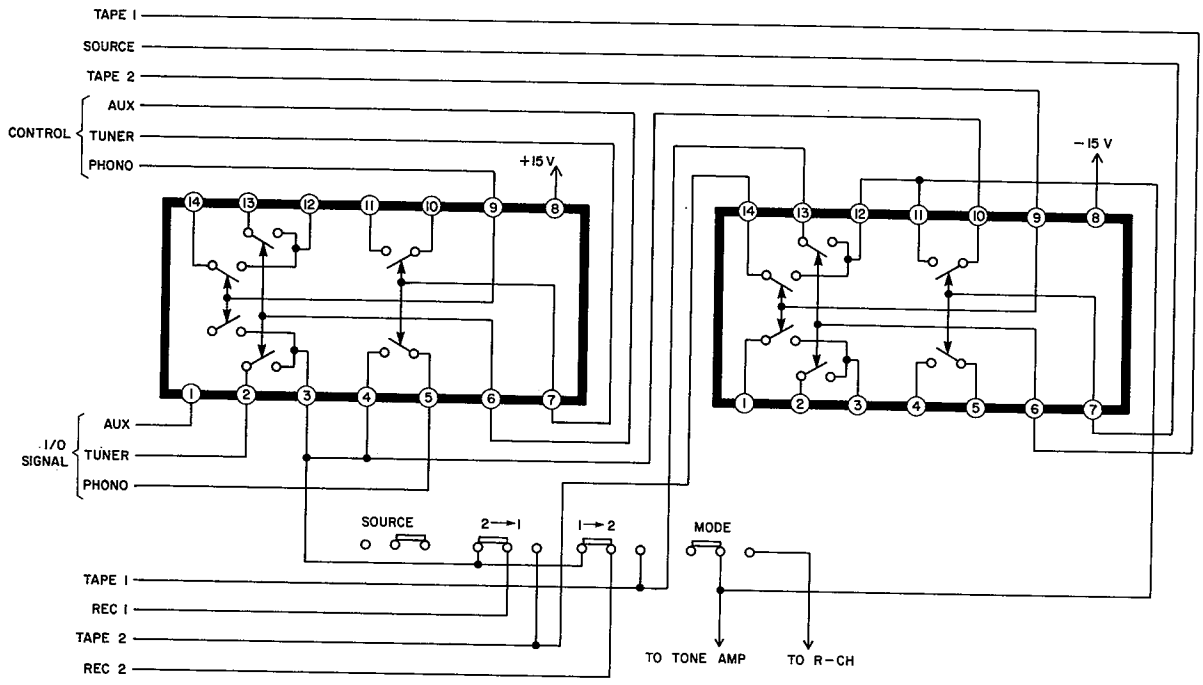


Fig. 13. Function Selector Electronic Switches.